

FCC Test Report (Part 24 – WCDMA B2, LTE B2/B25)

Report No.: RFBDKX-WTW-P22120419-4

FCC ID: 2ATIO4

Test Model: H4

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Issued Date: Mar. 31, 2023

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**FCC Registration /
Designation Number (1):** 788550 / TW0003

Test Location(2): No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

**FCC Registration /
Designation Number(2):** 281270 / TW0032



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Release Control Record

Issue No.	Description	Date Issued
RFBDKX-WTW-P22120419-4	Original Release	Mar. 31, 2023

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Equivalent Isotropically Radiated Power	Pass	Meet the requirement of limit.
2.1046 24.232 (d)	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -24.05dB at 3828.60MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (\pm)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3 dB
	30MHz ~ 1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038B	MY60180018	Feb. 18, 2022	Feb. 17, 2023
Spectrum Analyzer KEYSIGHT	N9020B	MY60110513	Dec. 26, 2022	Dec. 25, 2023
BILOG Antenna SCHWARZBECK	VULB9168	9168-1214	Oct. 20, 2022	Oct. 19, 2023
HORN Antenna RF SPIN	DRH18-E	210101A18E	Nov. 13, 2022	Nov. 12, 2023
HORN Antenna SCHWARZBECK	BBHA 9170	9170-1048	Nov. 13, 2022	Nov. 12, 2023
Loop Antenna TESEQ	HLA 6121	45745	Jul. 27, 2022	Jul. 26, 2023
Preamplifier EMCI	EMC330N	980798	Jan. 17, 2022	Jan. 16, 2023
			Jan. 16, 2023	Jan. 15, 2024
Preamplifier EMCI	EMC 012645	980115	Oct. 01, 2022	Sep. 30, 2023
Preamplifier EMCI	EMC184045SE	980786	Jan. 17, 2022	Jan. 16, 2023
			Jan. 16, 2023	Jan. 15, 2024
RF signal cable EMCI	EMC104-SM-SM- (9000+3000+1000)	201244+ 201232+ 210103	Jan. 17, 2022	Jan. 16, 2023
			Jan. 16, 2023	Jan. 15, 2024
RF signal cable EMCI	EMCCFD400-NM- NM- (9000+300+500)	201251+ 201249+ 201248	Jan. 17, 2022	Jan. 16, 2023
			Jan. 16, 2023	Jan. 15, 2024
RF signal cable EMCI	EMC101G-KM-KM- (5000+3000+2000)	201261+201258+ 201255	Jan. 17, 2022	Jan. 16, 2023
			Jan. 16, 2023	Jan. 15, 2024
Software BV ADT	ADT_Radiated_V7. 6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFA-515BSN	NA	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208676	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Mar. 03, 2022	Mar. 02, 2023
DC power supply Keysight	U8002A	MY56330015	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2022	Jun. 22, 2023
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 01, 2022	Jun. 30, 2023
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 27, 2022	Dec. 26, 2023
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 26, 2022	Dec. 25, 2023

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in WM Chamber 9.

3 General Information

3.1 General Description of EUT

Product	Home IOT Gateway	
Brand	Level	
Test Model	H4	
Sample Status	Engineering Sample	
Power Supply Rating	5 Vdc (From adapter) 3.6 Vdc (From battery)	
Modulation Type	WCDMA: BPSK, QPSK HSDPA: BPSK HSUPA: QPSK LTE: QPSK, 16QAM	
Operating Frequency	WCDMA Band 2	1852.4MHz ~ 1907.6MHz
	LTE Band 2 (Channel Bandwidth 1.4MHz)	1850.7MHz ~ 1909.3MHz
	LTE Band 2 (Channel Bandwidth 3MHz)	1851.5MHz ~ 1908.5MHz
	LTE Band 2 (Channel Bandwidth 5MHz)	1852.5MHz ~ 1907.5MHz
	LTE Band 2 (Channel Bandwidth 10MHz)	1855.0MHz ~ 1905.0MHz
	LTE Band 2 (Channel Bandwidth 15MHz)	1857.5MHz ~ 1902.5MHz
	LTE Band 2 (Channel Bandwidth 20MHz)	1860.0MHz ~ 1900.0MHz
	LTE Band 25 (Channel Bandwidth 1.4MHz)	1850.7MHz ~ 1914.3MHz
	LTE Band 25 (Channel Bandwidth 3MHz)	1851.5MHz ~ 1913.5MHz
	LTE Band 25 (Channel Bandwidth 5MHz)	1852.5MHz ~ 1912.5MHz
	LTE Band 25 (Channel Bandwidth 10MHz)	1855.0MHz ~ 1910.0MHz
	LTE Band 25 (Channel Bandwidth 15MHz)	1857.5MHz ~ 1907.5MHz
	LTE Band 25 (Channel Bandwidth 20MHz)	1860.0MHz ~ 1905.0MHz
	Max. EIRP Power	WCDMA Band 2
LTE Band 2 (Channel Bandwidth 1.4MHz)		337.287mW (25.28dBm)
LTE Band 2 (Channel Bandwidth 3MHz)		328.095mW (25.16dBm)
LTE Band 2 (Channel Bandwidth 5MHz)		327.341mW (25.15dBm)
LTE Band 2 (Channel Bandwidth 10MHz)		331.894mW (25.21dBm)
LTE Band 2 (Channel Bandwidth 15MHz)		342.768mW (25.35dBm)
LTE Band 2 (Channel Bandwidth 20MHz)		349.140mW (25.43dBm)
LTE Band 25 (Channel Bandwidth 1.4MHz)		335.738mW (25.26dBm)
LTE Band 25 (Channel Bandwidth 3MHz)		334.965mW (25.25dBm)
LTE Band 25 (Channel Bandwidth 5MHz)		334.195mW (25.24dBm)
LTE Band 25 (Channel Bandwidth 10MHz)		353.183mW (25.48dBm)
LTE Band 25 (Channel Bandwidth 15MHz)		352.371mW (25.47dBm)
LTE Band 25 (Channel Bandwidth 20MHz)		358.922mW (25.55dBm)

Emission Designator	WCDMA Band 2	4M14F9W
	LTE Band 2 (Channel Bandwidth 1.4MHz)	1M09G7D
	LTE Band 2 (Channel Bandwidth 3MHz)	2M70D7W
	LTE Band 2 (Channel Bandwidth 5MHz)	4M50G7D
	LTE Band 2 (Channel Bandwidth 10MHz)	8M97G7D
	LTE Band 2 (Channel Bandwidth 15MHz)	13M5G7D
	LTE Band 2 (Channel Bandwidth 20MHz)	17M9G7D
	LTE Band 25 (Channel Bandwidth 1.4MHz)	1M09G7D
	LTE Band 25 (Channel Bandwidth 3MHz)	2M70D7W
	LTE Band 25 (Channel Bandwidth 5MHz)	4M50G7D
	LTE Band 25 (Channel Bandwidth 10MHz)	8M97G7D
	LTE Band 25 (Channel Bandwidth 15MHz)	13M5G7D
	LTE Band 25 (Channel Bandwidth 20MHz)	17M9G7D
	Antenna Type	Refer to note
Accessory Device	Refer to note	
Cable Supplied	Refer to note	

Note:

1. The antenna information is listed as below.

Antenna Type	Antenna Gain (dBi)		
	WCDMA B2	LTE B2	LTE B25
PIFA	3.09	3.09	3.09

* Detail antenna specification please refer to antenna datasheet or an antenna gain measurement report.

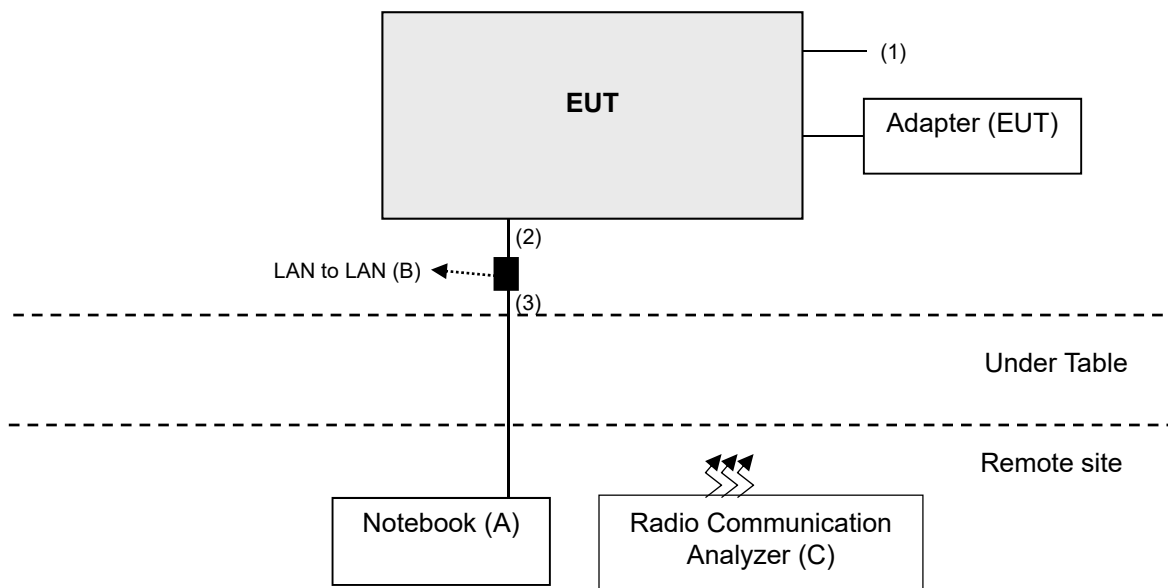
2. The EUT contains following accessory devices.

Battery	Brand	Grand-Pro
	Model	INR18650
	Power Rating	3.6Vdc, 3350mAh, 12.06Wh
AC Adapter	Brand	TENPO
	Model	S024AMP0500350
	AC Input	100-240Vac, 50/60Hz, 0.6A
	DC Output	5.0Vdc, 3.5A, 17.5W
	DC Output Cable	Non-shielded without cord, 1.0m
	AC Cable	Non-shielded without cord, 1.0m
Lan Cable	Signal Line	Non-shielded without cord, 1.0m

3. For WWAN 16QAM modulation bandwidths ≥ 10 MHz, EUT only supports up to 25RB.

4. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Notebook	Lenovo	20J4 MD A003TW	PF-11H9AK	N/A	Provided by Lab
B	LAN to LAN	N/A	N/A	N/A	N/A	Provided by Lab
C	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	N/A	Provided by Lab

Note: Item C acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Micro USB	1	1	N	0	Provided by Lab
2.	RJ45	1	1	N	0	Provided by client
3.	RJ45	1	6	N	0	Provided by Lab

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports. The EUT is designed to be positioned on the X-plane only.

WCDMA Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
-	Modulation Characteristics	9262 to 9538	9400 (1880.0MHz)	WCDMA, HSDPA, HSUPA
-	Frequency Stability	9262 to 9538	9262 (1852.4MHz), 9538 (1907.6MHz)	WCDMA
-	Occupied Bandwidth	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
-	Band Edge	9262 to 9538	9262 (1852.4MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
-	Peak To Average Ratio	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
-	Conducted Emission	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA, HSDPA, HSUPA
-	Radiated Emission Below 1GHz	9262 to 9538	9538 (1907.6MHz)	WCDMA
-	Radiated Emission Above 1GHz	9262 to 9538	9262 (1852.4MHz), 9400 (1880.0MHz), 9538 (1907.6MHz)	WCDMA

Note: For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.

LTE Band 2

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	EIRP	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	1 Half Full
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	18700 to 19100	18900 (1880.0MHz)	20MHz	QPSK / 16QAM	Full
-	Frequency Stability	18607 to 19193	18607 (1850.7MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	Full
		18615 to 19185	18615 (1851.5MHz), 19185 (1908.5MHz)	3MHz	QPSK	Full
		18625 to 19175	18625 (1852.5MHz), 19175 (1907.5MHz)	5MHz	QPSK	Full
		18650 to 19150	18650 (1855.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	Full
		18675 to 19125	18675 (1857.5MHz), 19125 (1902.5MHz)	15MHz	QPSK	Full
		18700 to 19100	18700 (1860.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	Full
-	Occupied Bandwidth	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	Full
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	Full
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	Full
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	Full
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	Full
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	Full

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	Band Edge	18607 to 19193	18607 (1850.7MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	1 Half Full
		18615 to 19185	18615 (1851.5MHz), 19185 (1908.5MHz)	3MHz	QPSK	1 Half Full
		18625 to 19175	18625 (1852.5MHz), 19175 (1907.5MHz)	5MHz	QPSK	1 Half Full
		18650 to 19150	18650 (1855.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	1 Half Full
		18675 to 19125	18675 (1857.5MHz), 19125 (1902.5MHz)	15MHz	QPSK	1 Half Full
		18700 to 19100	18700 (1860.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1 Half Full
-	Peak to Average Ratio	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK / 16QAM	1
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK / 16QAM	1
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK / 16QAM	1
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK / 16QAM	1
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK / 16QAM	1
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK / 16QAM	1

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	Conducted Emission	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	1
		18615 to 19185	18615 (1851.5MHz), 18900 (1880.0MHz), 19185 (1908.5MHz)	3MHz	QPSK	1
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK	1
		18650 to 19150	18650 (1855.0MHz), 18900 (1880.0MHz), 19150 (1905.0MHz)	10MHz	QPSK	1
		18675 to 19125	18675 (1857.5MHz), 18900 (1880.0MHz), 19125 (1902.5MHz)	15MHz	QPSK	1
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1
-	Radiated Emission Below 1GHz	18625 to 19175	19175 (1907.5MHz)	5MHz	QPSK	1
-	Radiated Emission Above 1GHz	18607 to 19193	18607 (1850.7MHz), 18900 (1880.0MHz), 19193 (1909.3MHz)	1.4MHz	QPSK	1
		18625 to 19175	18625 (1852.5MHz), 18900 (1880.0MHz), 19175 (1907.5MHz)	5MHz	QPSK	1
		18700 to 19100	18700 (1860.0MHz), 18900 (1880.0MHz), 19100 (1900.0MHz)	20MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

LTE Band 25

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	EIRP	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK / 16QAM	1 Half Full
		26055 to 26675	26055 (1851.5MHz), 26365 (1882.5MHz), 26675 (1913.5MHz)	3MHz	QPSK / 16QAM	1 Half Full
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK / 16QAM	1 Half Full
		26090 to 26640	26090 (1855.0MHz), 26365 (1882.5MHz), 26640 (1910.0MHz)	10MHz	QPSK / 16QAM	1 Half Full
		26115 to 26615	26115 (1857.5MHz), 26365 (1882.5MHz), 26615 (1907.5MHz)	15MHz	QPSK / 16QAM	1 Half Full
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK / 16QAM	1 Half Full
-	Modulation Characteristics	26140 to 26590	26365 (1882.5MHz)	20MHz	QPSK / 16QAM	Full
-	Frequency Stability	26047 to 26683	26047 (1850.7MHz), 26683 (1914.3MHz)	1.4MHz	QPSK	Full
		26055 to 26675	26055 (1851.5MHz), 26675 (1913.5MHz)	3MHz	QPSK	Full
		26065 to 26665	26065 (1852.5MHz), 26665 (1912.5MHz)	5MHz	QPSK	Full
		26090 to 26640	26090 (1855.0MHz), 26640 (1910.0MHz)	10MHz	QPSK	Full
		26115 to 26615	26115 (1857.5MHz), 26615 (1907.5MHz)	15MHz	QPSK	Full
		26140 to 26590	26140 (1860.0MHz), 26590 (1905.0MHz)	20MHz	QPSK	Full
-	Occupied Bandwidth	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK / 16QAM	Full
		26055 to 26675	26055 (1851.5MHz), 26365 (1882.5MHz), 26675 (1913.5MHz)	3MHz	QPSK / 16QAM	Full
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK / 16QAM	Full
		26090 to 26640	26090 (1855.0MHz), 26365 (1882.5MHz), 26640 (1910.0MHz)	10MHz	QPSK / 16QAM	Full
		26115 to 26615	26115 (1857.5MHz), 26365 (1882.5MHz), 26615 (1907.5MHz)	15MHz	QPSK / 16QAM	Full
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK / 16QAM	Full

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	Band Edge	26047 to 26683	26047 (1850.7MHz), 26683 (1914.3MHz)	1.4MHz	QPSK	1 Half Full
		26055 to 26675	26055 (1851.5MHz), 26675 (1913.5MHz)	3MHz	QPSK	1 Half Full
		26065 to 26665	26065 (1852.5MHz), 26665 (1912.5MHz)	5MHz	QPSK	1 Half Full
		26090 to 26640	26090 (1855.0MHz), 26640 (1910.0MHz)	10MHz	QPSK	1 Half Full
		26115 to 26615	26115 (1857.5MHz), 26615 (1907.5MHz)	15MHz	QPSK	1 Half Full
		26140 to 26590	26140 (1860.0MHz), 26590 (1905.0MHz)	20MHz	QPSK	1 Half Full
-	Peak to Average Ratio	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK / 16QAM	1
		26055 to 26675	26055 (1851.5MHz), 26365 (1882.5MHz), 26675 (1913.5MHz)	3MHz	QPSK / 16QAM	1
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK / 16QAM	1
		26090 to 26640	26090 (1855.0MHz), 26365 (1882.5MHz), 26640 (1910.0MHz)	10MHz	QPSK / 16QAM	1
		26115 to 26615	26115 (1857.5MHz), 26365 (1882.5MHz), 26615 (1907.5MHz)	15MHz	QPSK / 16QAM	1
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK / 16QAM	1

EUT Configure Mode	Test item	Available channel	Tested Channel	Channel Bandwidth	Modulation	RB #
-	Conducted Emission	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK	1
		26055 to 26675	26055 (1851.5MHz), 26365 (1882.5MHz), 26675 (1913.5MHz)	3MHz	QPSK	1
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK	1
		26090 to 26640	26090 (1855.0MHz), 26365 (1882.5MHz), 26640 (1910.0MHz)	10MHz	QPSK	1
		26115 to 26615	26115 (1857.5MHz), 26365 (1882.5MHz), 26615 (1907.5MHz)	15MHz	QPSK	1
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK	1
-	Radiated Emission Below 1GHz	26047 to 26683	26683 (1914.3MHz)	1.4MHz	QPSK	1
-	Radiated Emission Above 1GHz	26047 to 26683	26047 (1850.7MHz), 26365 (1882.5MHz), 26683 (1914.3MHz)	1.4MHz	QPSK	1
		26065 to 26665	26065 (1852.5MHz), 26365 (1882.5MHz), 26665 (1912.5MHz)	5MHz	QPSK	1
		26140 to 26590	26140 (1860.0MHz), 26365 (1882.5MHz), 26590 (1905.0MHz)	20MHz	QPSK	1

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. For radiated emission above 1GHz, according to 3GPP 36.521-1 Section 6.6.3.1.4.1, choose the lowest, 5MHz & highest channel bandwidth for final test.
3. The output power for QPSK and 16QAM, measured value of QPSK is higher than 16QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK and 16QAM modes, the other test items were performed under worse mode according to the maximum output power.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Modulation Characteristics	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Frequency Stability	25deg. C, 60%RH	3.6Vdc	Willy Cheng
Occupied Bandwidth	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Band Edge	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Peak To Average Ratio	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Conducted Emission	25deg. C, 60%RH	120Vac, 60Hz	Willy Cheng
Radiated Emission	23deg. C, 67%RH	120Vac, 60Hz	Adair Peng

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 2 watts e.i.r.p.

4.1.2 Test Procedures

Conducted Power Measurement:

The EUT was set up for the maximum power with WCDMA, LTE link data modulation and link up with simulator. The average (rms) power measurement was performed on emulator and power value was measured from power function on emulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Maximum EIRP / ERP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is

given in Equation as follows:

$$EIRP = P_{Meas} + G_T$$

$$ERP = P_{Meas} + G_T - 2.15$$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.3 Test Setup

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA II		
	9262	9400	9538
TX Channel	1852.4	1880	1907.6
Frequency (MHz)	21.77	21.73	21.62
RMC 12.2K	21.65	21.49	21.43
HSDPA	21.63	21.37	21.29

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	22.01	22.34	22.21
		1	50	22.26	22.04	22.07
		1	99	22.10	22.14	21.82
		50	0	20.84	21.20	21.12
		50	25	20.98	20.86	21.03
		50	50	21.13	20.98	20.88
		100	0	21.06	21.09	20.85
20M	16QAM	1	0	21.02	21.03	20.81
		1	50	21.07	20.93	20.90
		1	99	21.19	20.89	20.78
		25	0	20.57	20.66	20.54
		25	12	20.48	20.55	20.51
		25	25	20.61	20.61	20.53
		100	0	-	-	-

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	22.11	22.26	22.14
		1	37	22.24	22.18	22.18
		1	74	22.13	22.07	21.69
		36	0	20.90	21.12	21.10
		36	19	21.02	20.98	21.01
		36	39	21.09	20.99	20.92
		75	0	21.05	21.06	20.98
15M	16QAM	1	0	21.08	21.00	20.85
		1	37	21.11	20.88	20.99
		1	74	21.14	20.99	20.73
		25	0	20.48	20.75	20.51
		25	12	20.43	20.68	20.43
		25	25	20.42	20.44	20.40
		75	0	-	-	-

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	21.90	22.11	22.12
		1	24	21.85	21.98	22.05
		1	49	21.87	22.03	21.63
		25	0	20.77	21.18	21.01
		25	12	20.84	20.93	20.94
		25	25	20.90	20.92	20.92
		50	0	20.87	20.88	21.00
10M	16QAM	1	0	21.00	21.29	21.05
		1	24	20.62	20.97	20.88
		1	49	20.77	20.73	20.45
		25	0	19.86	20.38	20.06
		25	12	19.92	20.19	19.89
		25	25	20.08	20.12	19.83
		50	0	-	-	-

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	21.95	22.06	22.04
		1	12	21.86	22.01	22.02
		1	24	21.77	22.02	21.84
		12	0	20.87	21.12	20.98
		12	6	20.84	21.01	20.95
		12	13	20.78	20.91	20.77
		25	0	20.88	21.03	20.97
5M	16QAM	1	0	20.75	21.05	20.86
		1	12	20.84	21.08	20.83
		1	24	20.73	20.88	20.76
		12	0	19.89	20.04	19.96
		12	6	19.92	20.16	20.09
		12	13	19.88	20.05	19.85
		25	0	19.96	20.08	20.03

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	21.93	22.07	21.87
		1	7	22.06	22.03	21.86
		1	14	21.87	21.89	21.91
		8	0	20.93	20.95	20.87
		8	3	20.95	21.05	20.96
		8	7	20.86	20.92	20.74
		15	0	20.92	21.06	20.77
3M	16QAM	1	0	20.82	21.11	20.84
		1	7	21.07	21.14	20.71
		1	14	20.83	21.07	20.76
		8	0	19.99	20.23	20.07
		8	3	20.12	20.13	20.03
		8	7	20.05	20.10	19.89
		15	0	19.96	20.08	19.85

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	21.78	22.01	21.68
		1	2	21.92	22.19	21.87
		1	5	21.83	21.96	21.52
		3	0	21.84	21.99	21.76
		3	1	21.91	22.02	21.89
		3	3	21.85	22.01	21.56
		6	0	20.79	21.00	20.63
1.4M	16QAM	1	0	21.11	21.32	20.67
		1	2	21.00	21.13	20.89
		1	5	20.91	21.22	20.84
		3	0	20.71	21.08	20.86
		3	1	20.92	21.15	20.82
		3	3	21.22	21.07	20.91
		6	0	19.91	20.03	19.89

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26140	26365	26590
		Frequency (MHz)		1860	1882.5	1905
20M	QPSK	1	0	25.11	25.55	25.04
		1	50	25.07	25.45	25.34
		1	99	24.86	24.81	24.92
		50	0	24.90	25.32	25.12
		50	25	24.71	24.92	25.11
		50	50	24.65	24.92	25.15
		100	0	24.07	23.87	24.25
20M	16QAM	1	0	23.94	24.16	24.06
		1	50	23.85	23.84	23.94
		1	99	23.75	23.90	23.53
		25	0	23.52	23.67	23.46
		25	12	23.56	23.61	23.42
		25	25	23.64	23.35	23.37
		100	0	-	-	-

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26115	26365	26615
		Frequency (MHz)		1857.5	1882.5	1907.5
15M	QPSK	1	0	25.28	25.47	24.76
		1	37	25.16	25.15	25.14
		1	74	24.89	24.72	24.99
		36	0	24.54	25.28	25.19
		36	19	24.63	25.13	25.05
		36	39	24.53	24.67	25.38
		75	0	24.23	23.82	24.04
15M	16QAM	1	0	23.74	24.27	23.94
		1	37	24.19	23.86	23.96
		1	74	24.46	23.72	23.42
		25	0	23.58	23.45	23.21
		25	12	23.56	23.37	23.19
		25	25	23.55	23.29	23.13
		75	0	-	-	-

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26090	26365	26640
		Frequency (MHz)		1855	1882.5	1910
10M	QPSK	1	0	25.27	25.48	24.95
		1	24	25.17	25.36	25.19
		1	49	24.97	24.89	24.96
		25	0	24.72	25.17	25.31
		25	12	24.70	24.93	25.08
		25	25	24.71	24.75	25.34
		50	0	24.03	24.02	24.07
10M	16QAM	1	0	23.93	24.36	24.07
		1	24	23.97	23.85	24.17
		1	49	24.12	23.94	23.58
		25	0	24.05	24.03	23.97
		25	12	23.97	23.98	24.05
		25	25	23.82	23.98	24.01
		50	0	-	-	-

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26065	26365	26665
		Frequency (MHz)		1852.5	1882.5	1912.5
5M	QPSK	1	0	25.06	25.11	24.83
		1	12	25.07	24.94	25.08
		1	24	25.22	25.13	25.24
		12	0	24.87	24.84	24.96
		12	6	24.70	24.85	24.72
		12	13	24.67	24.75	24.91
		25	0	23.82	23.74	23.69
5M	16QAM	1	0	24.34	24.09	24.50
		1	12	24.29	24.01	24.33
		1	24	24.15	24.08	23.91
		12	0	23.94	23.76	23.88
		12	6	23.80	23.69	23.91
		12	13	23.78	23.92	24.04
		25	0	22.91	23.13	22.96

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26055	26365	26675
		Frequency (MHz)		1851.5	1882.5	1913.5
3M	QPSK	1	0	25.08	25.00	25.08
		1	7	24.88	25.24	25.21
		1	14	25.19	25.06	25.02
		8	0	24.99	25.15	25.04
		8	3	24.93	25.15	24.85
		8	7	24.82	25.08	25.25
		15	0	23.94	24.01	24.00
3M	16QAM	1	0	24.18	24.26	24.21
		1	7	23.90	24.09	24.17
		1	14	24.17	23.76	23.69
		8	0	23.92	23.88	24.07
		8	3	23.63	24.00	23.78
		8	7	23.88	23.82	23.83
		15	0	22.72	23.27	23.03

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26047	26365	26683
		Frequency (MHz)		1850.7	1882.5	1914.3
1.4M	QPSK	1	0	25.26	25.04	24.86
		1	2	24.96	25.15	25.09
		1	5	25.14	24.97	25.13
		3	0	24.94	24.99	25.09
		3	1	24.87	25.03	24.94
		3	3	24.78	24.91	25.11
		6	0	23.96	23.83	23.89
1.4M	16QAM	1	0	24.15	24.17	24.29
		1	2	24.12	24.01	24.13
		1	5	24.09	23.90	23.68
		3	0	23.83	23.97	24.11
		3	1	23.78	23.91	24.10
		3	3	23.93	24.05	24.01
		6	0	22.93	23.07	23.08

EIRP Power (dBm)

Band	WCDMA II		
TX Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880	1907.6
RMC 12.2K	24.86	24.82	24.71
HSDPA	24.74	24.58	24.52
HSUPA	24.72	24.46	24.38

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18700	18900	19100
		Frequency (MHz)		1860	1880	1900
20M	QPSK	1	0	25.10	25.43	25.30
		1	50	25.35	25.13	25.16
		1	99	25.19	25.23	24.91
		50	0	23.93	24.29	24.21
		50	25	24.07	23.95	24.12
		50	50	24.22	24.07	23.97
		100	0	24.15	24.18	23.94
20M	16QAM	1	0	24.11	24.12	23.90
		1	50	24.16	24.02	23.99
		1	99	24.28	23.98	23.87
		25	0	23.66	23.75	23.63
		25	12	23.57	23.64	23.60
		25	25	23.70	23.70	23.62
		100	0	-	-	-

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18675	18900	19125
		Frequency (MHz)		1857.5	1880	1902.5
15M	QPSK	1	0	25.20	25.35	25.23
		1	37	25.33	25.27	25.27
		1	74	25.22	25.16	24.78
		36	0	23.99	24.21	24.19
		36	19	24.11	24.07	24.10
		36	39	24.18	24.08	24.01
		75	0	24.14	24.15	24.07
15M	16QAM	1	0	24.17	24.09	23.94
		1	37	24.20	23.97	24.08
		1	74	24.23	24.08	23.82
		25	0	23.57	23.84	23.60
		25	12	23.52	23.77	23.52
		25	25	23.51	23.53	23.49
		75	0	-	-	-

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18650	18900	19150
		Frequency (MHz)		1855	1880	1905
10M	QPSK	1	0	24.99	25.20	25.21
		1	24	24.94	25.07	25.14
		1	49	24.96	25.12	24.72
		25	0	23.86	24.27	24.10
		25	12	23.93	24.02	24.03
		25	25	23.99	24.01	24.01
		50	0	23.96	23.97	24.09
10M	16QAM	1	0	24.09	24.38	24.14
		1	24	23.71	24.06	23.97
		1	49	23.86	23.82	23.54
		25	0	22.95	23.47	23.15
		25	12	23.01	23.28	22.98
		25	25	23.17	23.21	22.92
		50	0	-	-	-

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18625	18900	19175
		Frequency (MHz)		1852.5	1880	1907.5
5M	QPSK	1	0	25.04	25.15	25.13
		1	12	24.95	25.10	25.11
		1	24	24.86	25.11	24.93
		12	0	23.96	24.21	24.07
		12	6	23.93	24.10	24.04
		12	13	23.87	24.00	23.86
		25	0	23.97	24.12	24.06
5M	16QAM	1	0	23.84	24.14	23.95
		1	12	23.93	24.17	23.92
		1	24	23.82	23.97	23.85
		12	0	22.98	23.13	23.05
		12	6	23.01	23.25	23.18
		12	13	22.97	23.14	22.94
		25	0	23.05	23.17	23.12

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18615	18900	19185
		Frequency (MHz)		1851.5	1880	1908.5
3M	QPSK	1	0	25.02	25.16	24.96
		1	7	25.15	25.12	24.95
		1	14	24.96	24.98	25.00
		8	0	24.02	24.04	23.96
		8	3	24.04	24.14	24.05
		8	7	23.95	24.01	23.83
		15	0	24.01	24.15	23.86
3M	16QAM	1	0	23.91	24.20	23.93
		1	7	24.16	24.23	23.80
		1	14	23.92	24.16	23.85
		8	0	23.08	23.32	23.16
		8	3	23.21	23.22	23.12
		8	7	23.14	23.19	22.98
		15	0	23.05	23.17	22.94

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 2						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		18607	18900	19193
		Frequency (MHz)		1850.7	1880	1909.3
1.4M	QPSK	1	0	24.87	25.10	24.77
		1	2	25.01	25.28	24.96
		1	5	24.92	25.05	24.61
		3	0	24.93	25.08	24.85
		3	1	25.00	25.11	24.98
		3	3	24.94	25.10	24.65
		6	0	23.88	24.09	23.72
1.4M	16QAM	1	0	24.20	24.41	23.76
		1	2	24.09	24.22	23.98
		1	5	24.00	24.31	23.93
		3	0	23.80	24.17	23.95
		3	1	24.01	24.24	23.91
		3	3	24.31	24.16	24.00
		6	0	23.00	23.12	22.98

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26140	26365	26590
		Frequency (MHz)		1860	1882.5	1905
20M	QPSK	1	0	25.11	25.55	25.04
		1	50	25.07	25.45	25.34
		1	99	24.86	24.81	24.92
		50	0	24.90	25.32	25.12
		50	25	24.71	24.92	25.11
		50	50	24.65	24.92	25.15
		100	0	24.07	23.87	24.25
20M	16QAM	1	0	23.94	24.16	24.06
		1	50	23.85	23.84	23.94
		1	99	23.75	23.90	23.53
		25	0	23.52	23.67	23.46
		25	12	23.56	23.61	23.42
		25	25	23.64	23.35	23.37
		100	0	-	-	-

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26115	26365	26615
		Frequency (MHz)		1857.5	1882.5	1907.5
15M	QPSK	1	0	25.28	25.47	24.76
		1	37	25.16	25.15	25.14
		1	74	24.89	24.72	24.99
		36	0	24.54	25.28	25.19
		36	19	24.63	25.13	25.05
		36	39	24.53	24.67	25.38
		75	0	24.23	23.82	24.04
15M	16QAM	1	0	23.74	24.27	23.94
		1	37	24.19	23.86	23.96
		1	74	24.46	23.72	23.42
		25	0	23.58	23.45	23.21
		25	12	23.56	23.37	23.19
		25	25	23.55	23.29	23.13
		75	0	-	-	-

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26090	26365	26640
		Frequency (MHz)		1855	1882.5	1910
10M	QPSK	1	0	25.27	25.48	24.95
		1	24	25.17	25.36	25.19
		1	49	24.97	24.89	24.96
		25	0	24.72	25.17	25.31
		25	12	24.70	24.93	25.08
		25	25	24.71	24.75	25.34
		50	0	24.03	24.02	24.07
10M	16QAM	1	0	23.93	24.36	24.07
		1	24	23.97	23.85	24.17
		1	49	24.12	23.94	23.58
		25	0	24.05	24.03	23.97
		25	12	23.97	23.98	24.05
		25	25	23.82	23.98	24.01
		50	0	-	-	-

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26065	26365	26665
		Frequency (MHz)		1852.5	1882.5	1912.5
5M	QPSK	1	0	25.06	25.11	24.83
		1	12	25.07	24.94	25.08
		1	24	25.22	25.13	25.24
		12	0	24.87	24.84	24.96
		12	6	24.70	24.85	24.72
		12	13	24.67	24.75	24.91
		25	0	23.82	23.74	23.69
5M	16QAM	1	0	24.34	24.09	24.50
		1	12	24.29	24.01	24.33
		1	24	24.15	24.08	23.91
		12	0	23.94	23.76	23.88
		12	6	23.80	23.69	23.91
		12	13	23.78	23.92	24.04
		25	0	22.91	23.13	22.96

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26055	26365	26675
		Frequency (MHz)		1851.5	1882.5	1913.5
3M	QPSK	1	0	25.08	25.00	25.08
		1	7	24.88	25.24	25.21
		1	14	25.19	25.06	25.02
		8	0	24.99	25.15	25.04
		8	3	24.93	25.15	24.85
		8	7	24.82	25.08	25.25
		15	0	23.94	24.01	24.00
3M	16QAM	1	0	24.18	24.26	24.21
		1	7	23.90	24.09	24.17
		1	14	24.17	23.76	23.69
		8	0	23.92	23.88	24.07
		8	3	23.63	24.00	23.78
		8	7	23.88	23.82	23.83
		15	0	22.72	23.27	23.03

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

LTE Band 25						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		26047	26365	26683
		Frequency (MHz)		1850.7	1882.5	1914.3
1.4M	QPSK	1	0	25.26	25.04	24.86
		1	2	24.96	25.15	25.09
		1	5	25.14	24.97	25.13
		3	0	24.94	24.99	25.09
		3	1	24.87	25.03	24.94
		3	3	24.78	24.91	25.11
		6	0	23.96	23.83	23.89
1.4M	16QAM	1	0	24.15	24.17	24.29
		1	2	24.12	24.01	24.13
		1	5	24.09	23.90	23.68
		3	0	23.83	23.97	24.11
		3	1	23.78	23.91	24.10
		3	3	23.93	24.05	24.01
		6	0	22.93	23.07	23.08

*EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

4.2 Modulation Characteristics Measurement

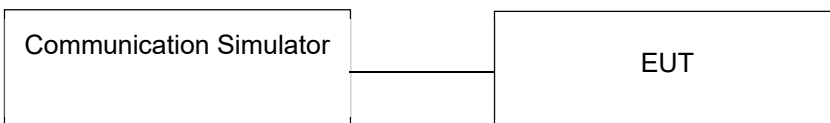
4.2.1 Limits of Modulation Characteristics

N/A

4.2.2 Test Procedure

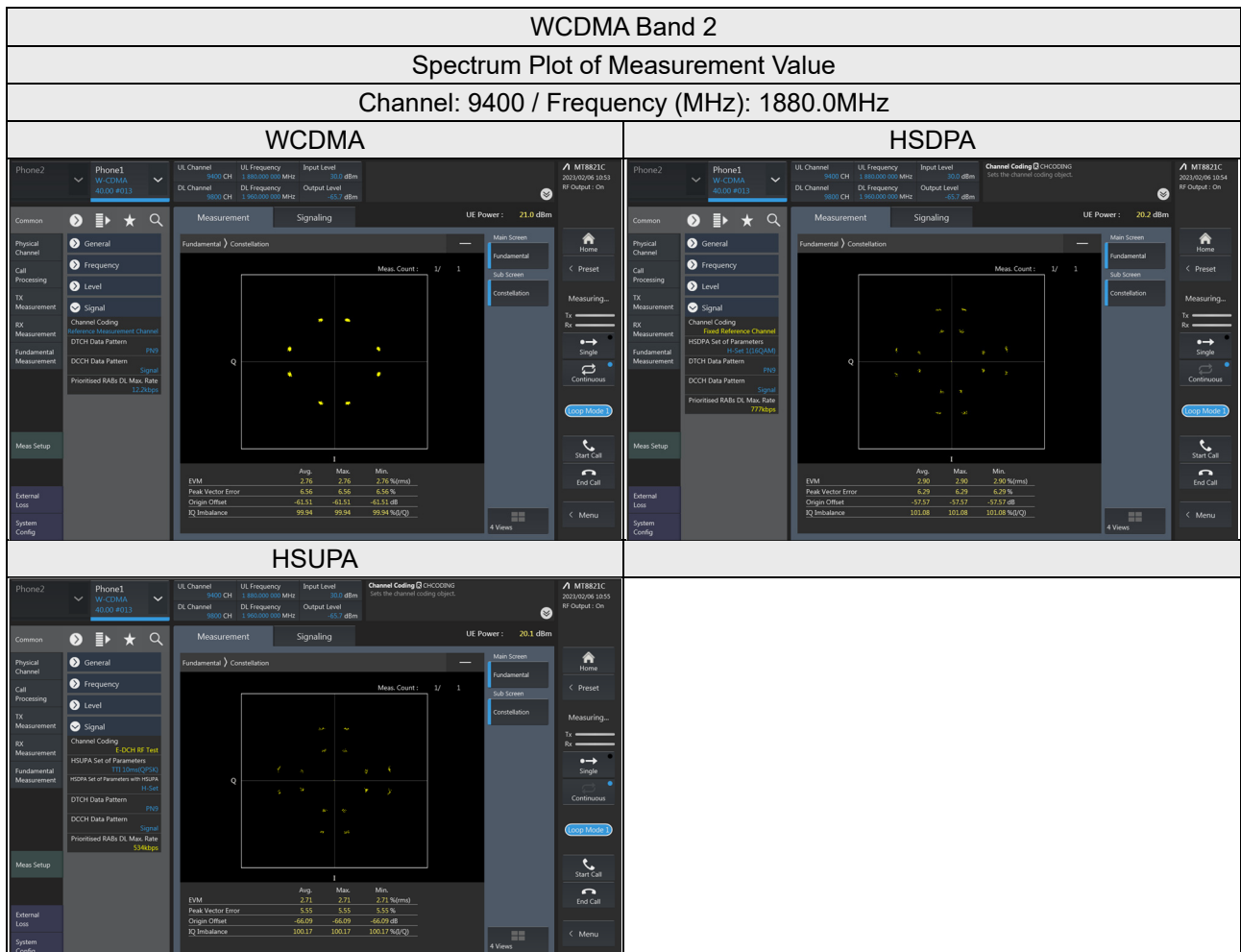
Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.3 Test Setup

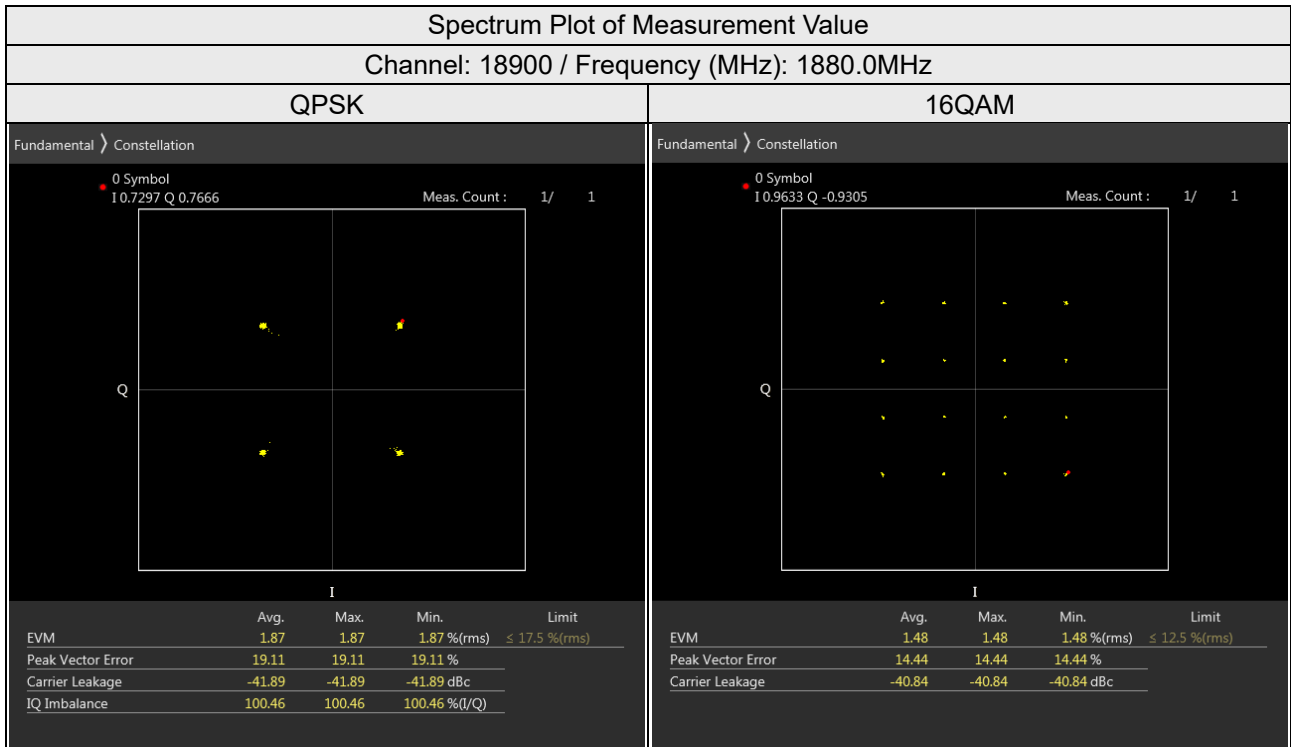


4.2.4 Test Results

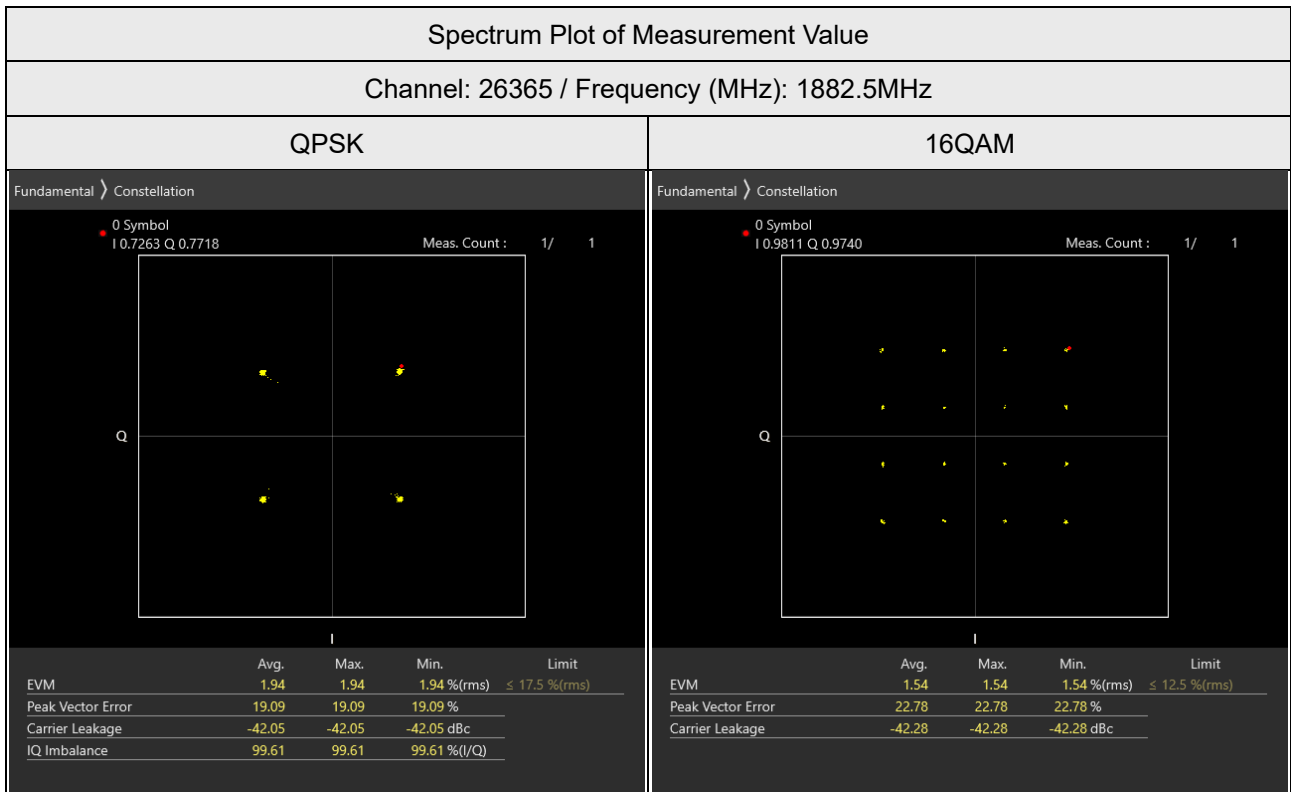
WCDMA Band 2



LTE Band 2



LTE Band 25



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

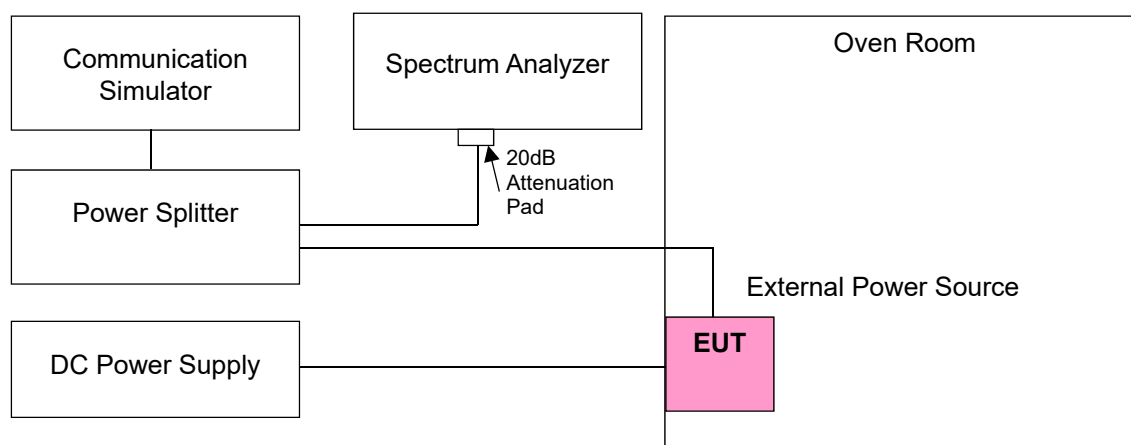
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

4.3.2 Test Procedure

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Conducted Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Vdc)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1852.3999970	-0.002	1907.5999980	-0.001
3.60	1852.3999980	-0.001	1907.6000010	0.001
4.14	1852.3999960	-0.002	1907.5999990	-0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.3999960	-0.002	1907.5999990	-0.001
-20	1852.3999990	-0.001	1907.5999970	-0.002
-10	1852.3999990	-0.001	1907.6000010	0.001
0	1852.4000040	0.002	1907.5999960	-0.002
10	1852.3999970	-0.002	1907.6000020	0.001
20	1852.4000010	0.001	1907.6000010	0.001
30	1852.3999970	-0.002	1907.5999970	-0.002
40	1852.4000020	0.001	1907.5999960	-0.002
50	1852.4000010	0.001	1907.6000030	0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1850.6999980	-0.001	1909.3000020	0.001
3.60	1850.7000030	0.002	1909.2999960	-0.002
4.14	1850.6999990	-0.001	1909.3000020	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.6999970	-0.002	1909.3000040	0.002
-20	1850.6999980	-0.001	1909.3000010	0.001
-10	1850.7000040	0.002	1909.3000030	0.002
0	1850.6999970	-0.002	1909.3000040	0.002
10	1850.6999990	-0.001	1909.2999970	-0.002
20	1850.7000030	0.002	1909.2999970	-0.002
30	1850.6999980	-0.001	1909.2999990	-0.001
40	1850.6999970	-0.002	1909.2999980	-0.001
50	1850.6999990	-0.001	1909.3000040	0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1851.5000020	0.001	1908.4999960	-0.002
3.60	1851.5000030	0.002	1908.5000020	0.001
4.14	1851.5000020	0.001	1908.5000010	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.4999980	-0.001	1908.4999970	-0.002
-20	1851.4999990	-0.001	1908.5000040	0.002
-10	1851.5000030	0.002	1908.4999970	-0.002
0	1851.4999970	-0.002	1908.4999980	-0.001
10	1851.4999990	-0.001	1908.5000040	0.002
20	1851.5000040	0.002	1908.4999970	-0.002
30	1851.4999960	-0.002	1908.4999980	-0.001
40	1851.5000020	0.001	1908.5000040	0.002
50	1851.5000040	0.002	1908.5000010	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1852.4999970	-0.002	1907.4999990	-0.001
3.60	1852.4999990	-0.001	1907.4999960	-0.002
4.14	1852.5000020	0.001	1907.5000030	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.4999990	-0.001	1907.4999960	-0.002
-20	1852.5000010	0.001	1907.4999970	-0.002
-10	1852.5000030	0.002	1907.4999960	-0.002
0	1852.5000010	0.001	1907.4999990	-0.001
10	1852.4999960	-0.002	1907.4999970	-0.002
20	1852.4999960	-0.002	1907.5000030	0.002
30	1852.4999990	-0.001	1907.4999990	-0.001
40	1852.5000040	0.002	1907.4999980	-0.001
50	1852.4999970	-0.002	1907.5000030	0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1854.9999980	-0.001	1905.0000030	0.002
3.60	1855.0000010	0.001	1904.9999960	-0.002
4.14	1854.9999980	-0.001	1905.0000020	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.0000020	0.001	1905.0000010	0.001
-20	1855.0000030	0.002	1904.9999960	-0.002
-10	1854.9999970	-0.002	1904.9999970	-0.002
0	1855.0000010	0.001	1905.0000040	0.002
10	1855.0000020	0.001	1904.9999990	-0.001
20	1855.0000040	0.002	1904.9999980	-0.001
30	1854.9999990	-0.001	1905.0000010	0.001
40	1854.9999980	-0.001	1905.0000030	0.002
50	1854.9999960	-0.002	1904.9999960	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1857.4999970	-0.002	1902.5000020	0.001
3.60	1857.4999960	-0.002	1902.4999960	-0.002
4.14	1857.4999960	-0.002	1902.5000030	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.4999970	-0.002	1902.4999970	-0.002
-20	1857.4999970	-0.002	1902.5000010	0.001
-10	1857.4999970	-0.002	1902.4999990	-0.001
0	1857.5000040	0.002	1902.4999980	-0.001
10	1857.4999960	-0.002	1902.5000040	0.002
20	1857.5000010	0.001	1902.5000030	0.002
30	1857.5000040	0.002	1902.5000030	0.002
40	1857.4999980	-0.001	1902.5000040	0.002
50	1857.5000020	0.001	1902.5000030	0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1859.9999960	-0.002	1900.0000030	0.002
3.60	1860.0000040	0.002	1900.0000010	0.001
4.14	1860.0000030	0.002	1899.9999970	-0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1859.9999990	-0.001	1899.9999990	-0.001
-20	1859.9999970	-0.002	1900.0000030	0.002
-10	1859.9999980	-0.001	1900.0000010	0.001
0	1859.9999990	-0.001	1900.0000020	0.001
10	1860.0000030	0.002	1899.9999980	-0.001
20	1859.9999960	-0.002	1900.0000020	0.001
30	1860.0000010	0.001	1899.9999990	-0.001
40	1860.0000010	0.001	1900.0000010	0.001
50	1860.0000030	0.002	1899.9999970	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1850.6999960	-0.002	1914.3000020	0.001
3.60	1850.6999990	-0.001	1914.2999970	-0.002
4.14	1850.7000020	0.001	1914.2999980	-0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.6999970	-0.002	1914.2999970	-0.002
-20	1850.6999980	-0.001	1914.3000040	0.002
-10	1850.7000040	0.002	1914.2999960	-0.002
0	1850.7000010	0.001	1914.3000020	0.001
10	1850.6999990	-0.001	1914.3000020	0.001
20	1850.6999990	-0.001	1914.3000030	0.002
30	1850.6999970	-0.002	1914.2999960	-0.002
40	1850.6999970	-0.002	1914.3000030	0.002
50	1850.7000010	0.001	1914.3000010	0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1851.5000010	0.001	1913.4999990	-0.001
3.60	1851.5000030	0.002	1913.4999980	-0.001
4.14	1851.4999960	-0.002	1913.5000030	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 3MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.4999980	-0.001	1913.4999980	-0.001
-20	1851.5000030	0.002	1913.4999960	-0.002
-10	1851.5000010	0.001	1913.5000010	0.001
0	1851.4999960	-0.002	1913.5000040	0.002
10	1851.5000020	0.001	1913.4999960	-0.002
20	1851.4999970	-0.002	1913.5000010	0.001
30	1851.5000040	0.002	1913.4999990	-0.001
40	1851.4999970	-0.002	1913.4999970	-0.002
50	1851.5000030	0.002	1913.4999960	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1852.4999960	-0.002	1912.4999960	-0.002
3.60	1852.4999970	-0.002	1912.4999990	-0.001
4.14	1852.4999980	-0.001	1912.5000020	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.5000040	0.002	1912.5000020	0.001
-20	1852.5000040	0.002	1912.5000010	0.001
-10	1852.4999970	-0.002	1912.5000020	0.001
0	1852.5000040	0.002	1912.4999970	-0.002
10	1852.4999970	-0.002	1912.5000010	0.001
20	1852.5000030	0.002	1912.4999970	-0.002
30	1852.4999970	-0.002	1912.4999980	-0.001
40	1852.4999960	-0.002	1912.4999990	-0.001
50	1852.5000040	0.002	1912.4999980	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1855.0000010	0.001	1909.9999960	-0.002
3.60	1855.0000020	0.001	1909.9999960	-0.002
4.14	1855.0000020	0.001	1910.0000020	0.001

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.0000020	0.001	1909.9999970	-0.002
-20	1855.0000030	0.002	1909.9999960	-0.002
-10	1855.0000030	0.002	1910.0000020	0.001
0	1854.9999970	-0.002	1910.0000020	0.001
10	1855.0000030	0.002	1910.0000030	0.002
20	1855.0000010	0.001	1910.0000030	0.002
30	1855.0000020	0.001	1910.0000020	0.001
40	1855.0000030	0.002	1910.0000040	0.002
50	1854.9999990	-0.001	1909.9999990	-0.001

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1857.5000020	0.001	1907.4999990	-0.001
3.60	1857.4999960	-0.002	1907.5000010	0.001
4.14	1857.4999980	-0.001	1907.5000030	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.5000040	0.002	1907.5000030	0.002
-20	1857.4999980	-0.001	1907.5000040	0.002
-10	1857.5000010	0.001	1907.4999990	-0.001
0	1857.4999960	-0.002	1907.4999960	-0.002
10	1857.5000040	0.002	1907.5000010	0.001
20	1857.5000040	0.002	1907.5000010	0.001
30	1857.5000030	0.002	1907.4999990	-0.001
40	1857.4999970	-0.002	1907.5000030	0.002
50	1857.5000020	0.001	1907.4999960	-0.002

Frequency Error vs. Voltage

Voltage (Vdc)	LTE Band 25			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.06	1860.0000020	0.001	1905.0000010	0.001
3.60	1859.9999970	-0.002	1904.9999960	-0.002
4.14	1860.0000010	0.001	1905.0000030	0.002

Note: The applicant defined the normal working voltage is from 3.06Vdc to 4.14Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 25			
	Channel Bandwidth 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.0000010	0.001	1904.9999960	-0.002
-20	1859.9999980	-0.001	1905.0000010	0.001
-10	1860.0000030	0.002	1904.9999970	-0.002
0	1860.0000040	0.002	1905.0000010	0.001
10	1859.9999960	-0.002	1905.0000040	0.002
20	1860.0000030	0.002	1905.0000020	0.001
30	1860.0000020	0.001	1905.0000020	0.001
40	1859.9999970	-0.002	1904.9999980	-0.001
50	1859.9999980	-0.001	1905.0000040	0.002

4.4 Occupied Bandwidth Measurement

4.4.1 Limits of Occupied Bandwidth Measurement

The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 % of the total mean power radiated by a given emission.

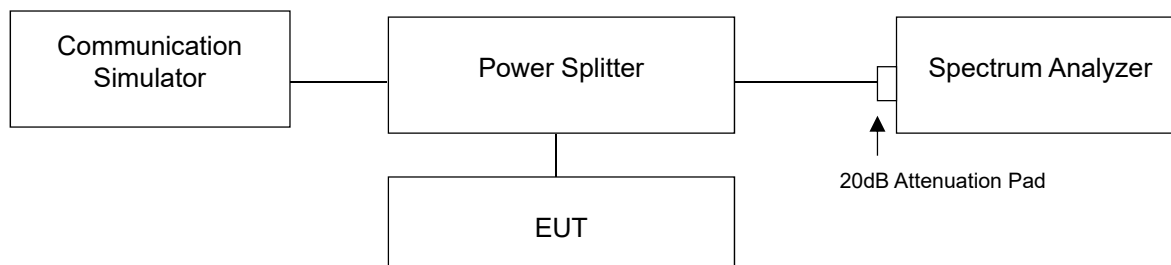
4.4.2 Test Procedure

For the 26dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- Determine the following reference values: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

For the occupied bandwidth measurement method, please refer to section 5.4.4 of ANSI C63.26.

4.4.3 Test Setup

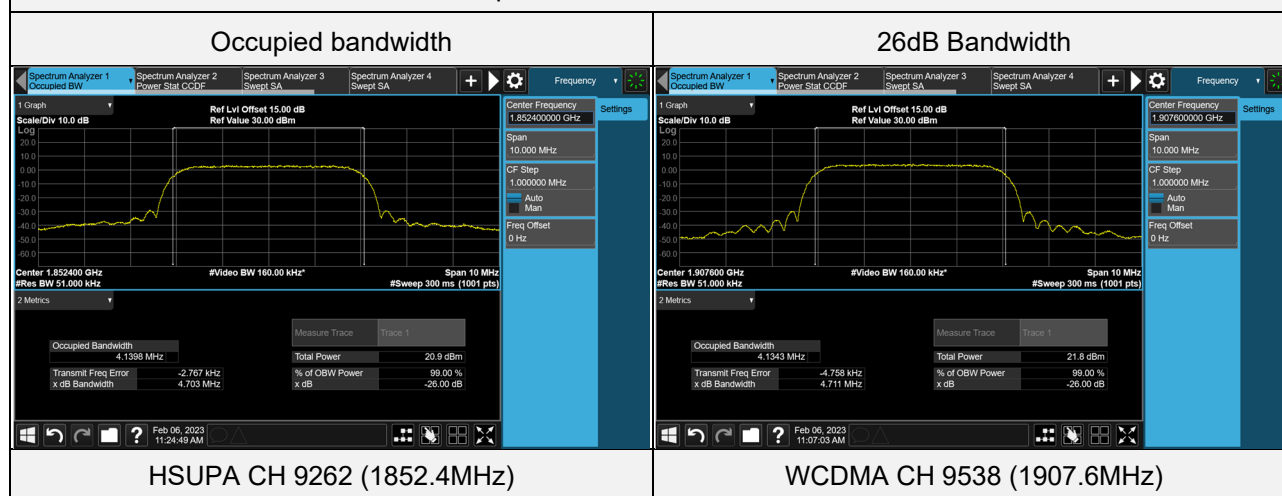


4.4.4 Test Result

WCDMA Band 2

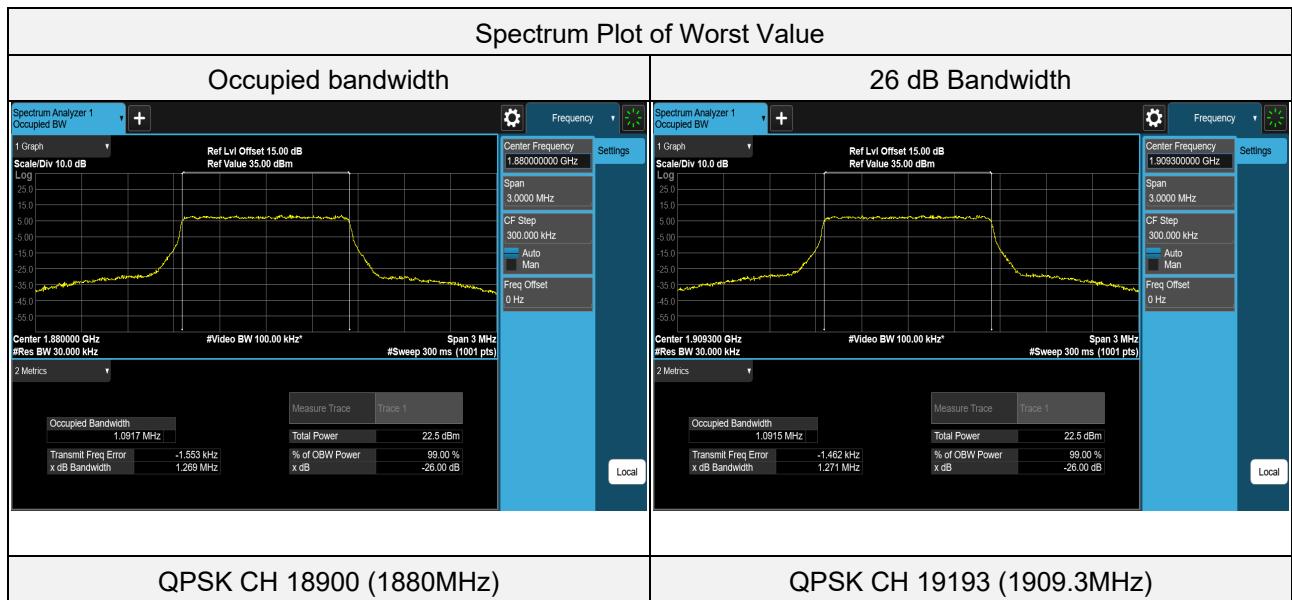
Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA	9262	1852.4	4.1340	4.702
WCDMA	9400	1880.0	4.1345	4.705
WCDMA	9538	1907.6	4.1343	4.711
HSDPA	9262	1852.4	4.1396	4.703
HSDPA	9400	1880.0	4.1335	4.703
HSDPA	9538	1907.6	4.1380	4.704
HSUPA	9262	1852.4	4.1398	4.703
HSUPA	9400	1880.0	4.1367	4.695
HSUPA	9538	1907.6	4.1326	4.704

Spectrum Plot of Worst Value



LTE Band 2 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18607	1850.7	1.0868	1.249
QPSK	18900	1880	1.0917	1.269
QPSK	19193	1909.3	1.0915	1.271
16QAM	18607	1850.7	1.0884	1.253
16QAM	18900	1880	1.0896	1.252
16QAM	19193	1909.3	1.0900	1.252

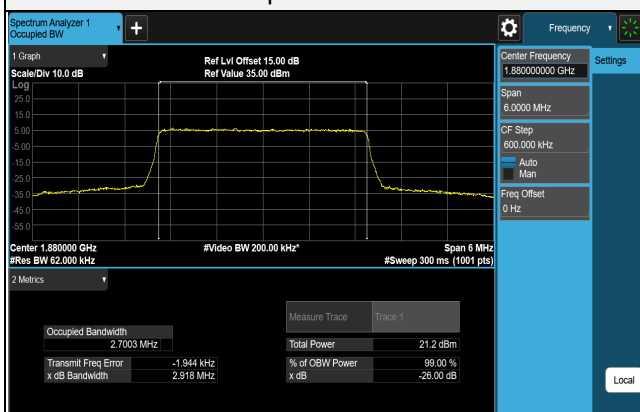


LTE Band 2 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18615	1851.5	2.6997	2.913
QPSK	18900	1880	2.6995	2.917
QPSK	19185	1908.5	2.6961	2.925
16QAM	18615	1851.5	2.6990	2.922
16QAM	18900	1880	2.7003	2.918
16QAM	19185	1908.5	2.6985	2.914

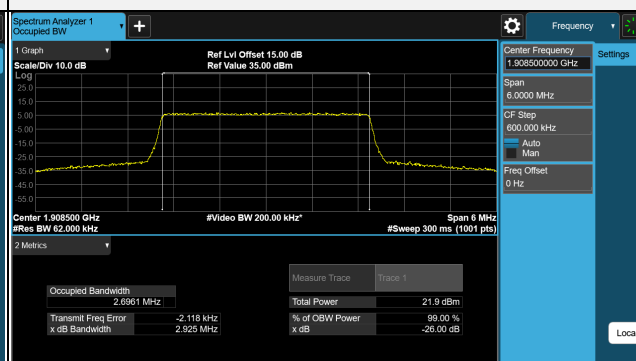
Spectrum Plot of Worst Value

Occupied bandwidth



16QAM CH 18900 (1880MHz)

26 dB bandwidth

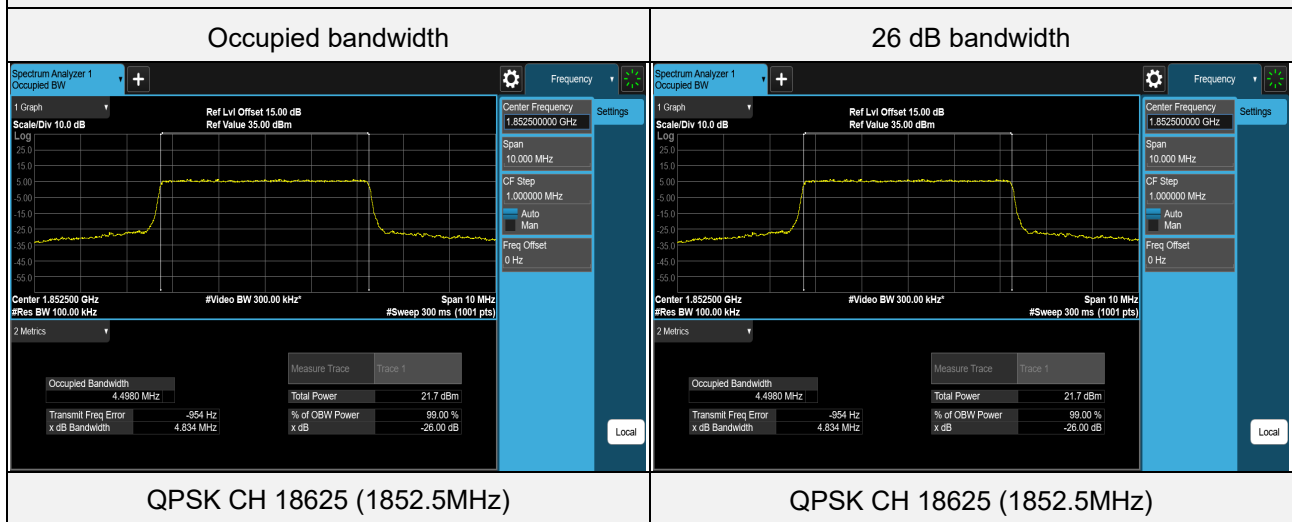


QPSK CH 19185 (1908.5MHz)

LTE Band 2 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18625	1852.5	4.4980	4.834
QPSK	18900	1880	4.4955	4.826
QPSK	19175	1907.5	4.4928	4.815
16QAM	18625	1852.5	4.4938	4.809
16QAM	18900	1880	4.4937	4.822
16QAM	19175	1907.5	4.4923	4.827

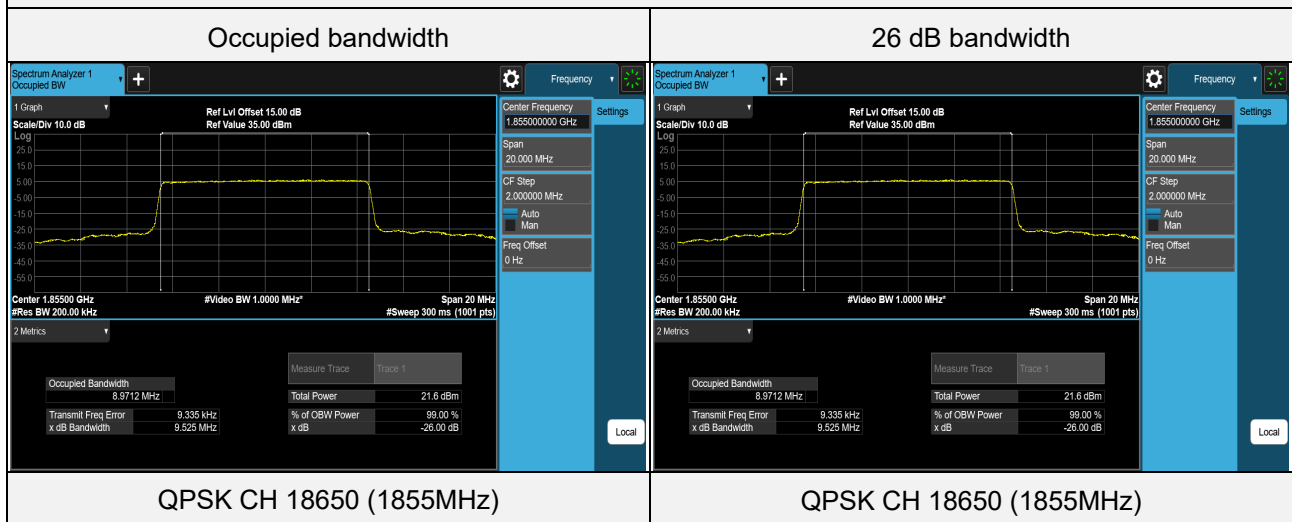
Spectrum Plot of Worst Value



LTE Band 2 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18650	1855	8.9712	9.525
QPSK	18900	1880	8.9602	9.515
QPSK	19150	1905	8.9597	9.512
16QAM	18650	1855	4.5753	5.096
16QAM	18900	1880	4.5725	5.091
16QAM	19150	1905	4.5698	5.071

Spectrum Plot of Worst Value

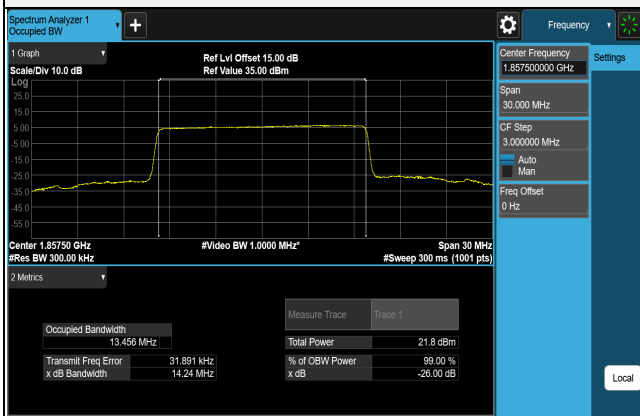


LTE Band 2 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18675	1857.5	13.4556	14.236
QPSK	18900	1880	13.4514	14.218
QPSK	19125	1902.5	13.4221	14.220
16QAM	18675	1857.5	4.6796	5.333
16QAM	18900	1880	4.6700	5.407
16QAM	19125	1902.5	4.6767	5.389

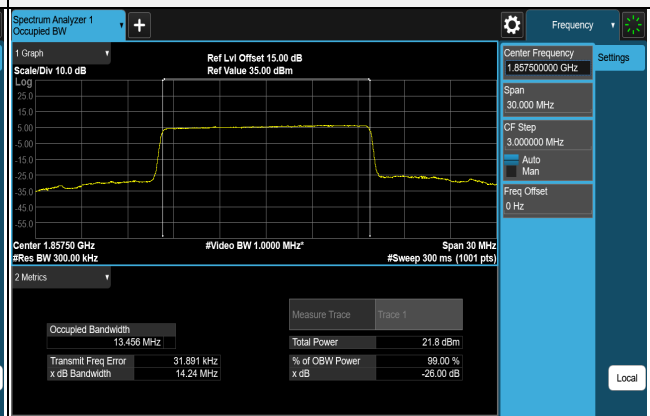
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 18675 (1857.5MHz)

26 dB bandwidth



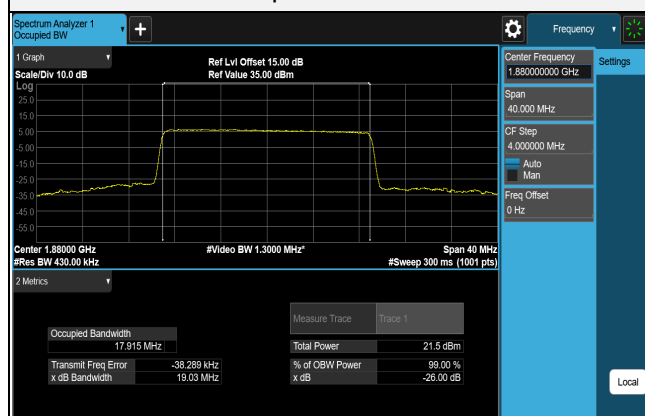
QPSK CH 18675 (1857.5MHz)

LTE Band 2 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	18700	1860	17.898	19.00
QPSK	18900	1880	17.915	19.03
QPSK	19100	1900	17.878	19.00
16QAM	18700	1860	4.8220	5.610
16QAM	18900	1880	4.8174	5.599
16QAM	19100	1900	4.8161	5.594

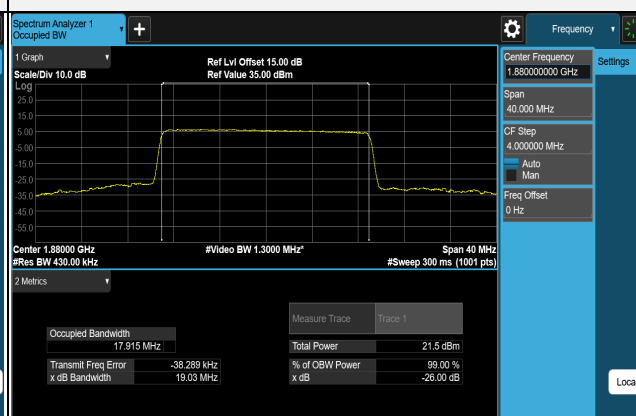
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 18900 (1880MHz)

26 dB bandwidth



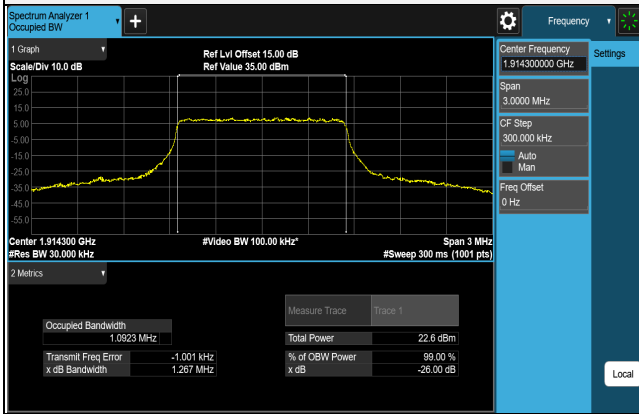
QPSK CH 18900 (1880MHz)

LTE Band 25 (Channel Bandwidth 1.4MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26047	1850.7	1.0894	1.257
QPSK	26365	1882.5	1.0919	1.270
QPSK	26683	1914.3	1.0923	1.267
16QAM	26047	1850.7	1.0880	1.251
16QAM	26365	1882.5	1.0882	1.249
16QAM	26683	1914.3	1.0877	1.238

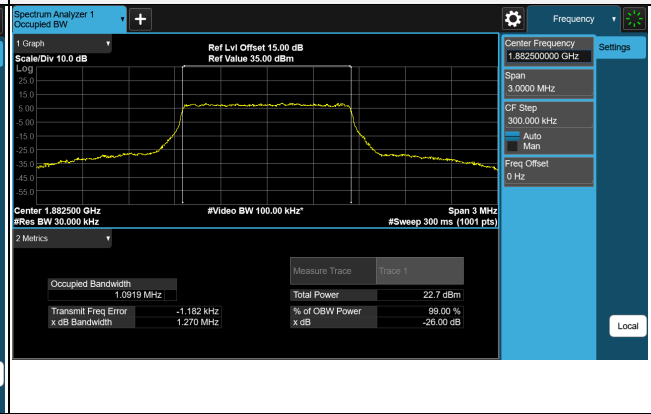
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 26683 (1914.3 MHz)

26 dB bandwidth



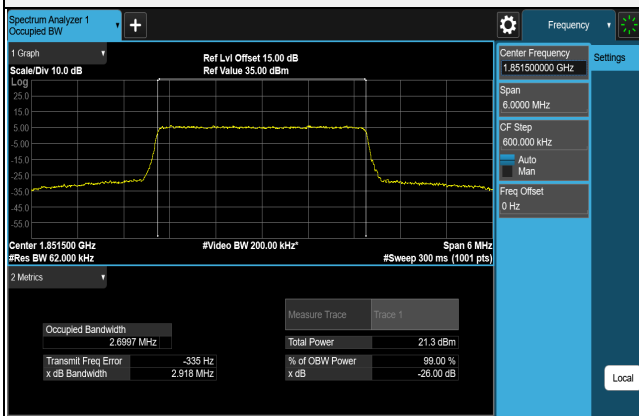
QPSK CH 26365 (1882.5 MHz)

LTE Band 25 (Channel Bandwidth 3MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26055	1851.5	2.6966	2.928
QPSK	26365	1882.5	2.6963	2.922
QPSK	26675	1913.5	2.6956	2.919
16QAM	26055	1851.5	2.6997	2.918
16QAM	26365	1882.5	2.6933	2.915
16QAM	26675	1913.5	2.6939	2.933

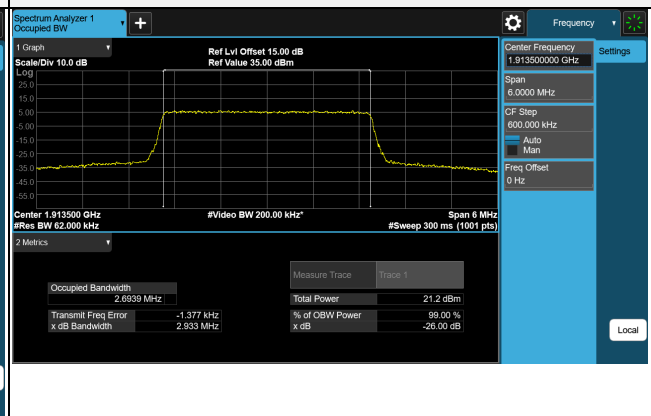
Spectrum Plot of Worst Value

Occupied bandwidth



16QAM CH 26055 (1851.5 MHz)

26 dB bandwidth



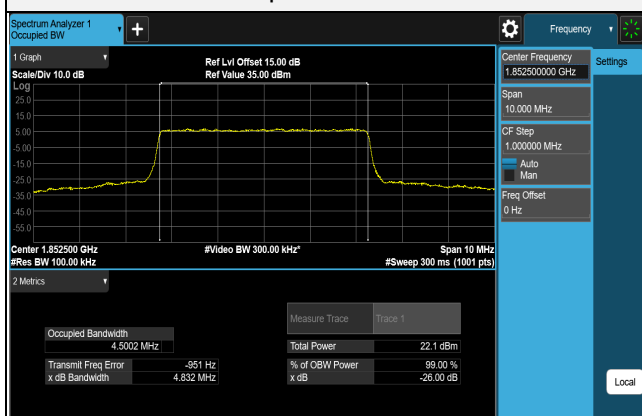
16QAM CH 26675 (1913.5 MHz)

LTE Band 25 (Channel Bandwidth 5MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26065	1852.5	4.5002	4.832
QPSK	26365	1882.5	4.4993	4.842
QPSK	26665	1912.5	4.4949	4.819
16QAM	26065	1852.5	4.4926	4.823
16QAM	26365	1882.5	4.4946	4.834
16QAM	26665	1912.5	4.4920	4.813

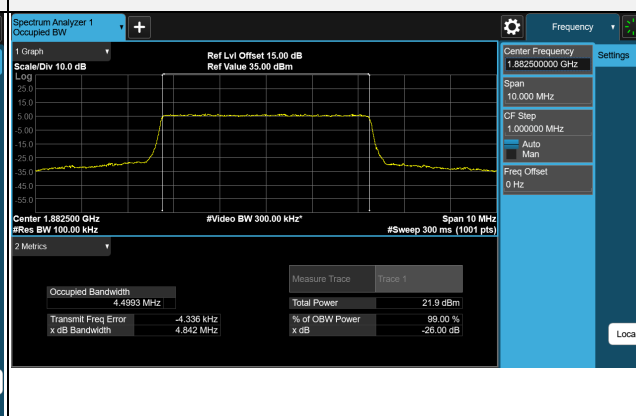
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 26065 (1852.5 MHz)

26 dB bandwidth

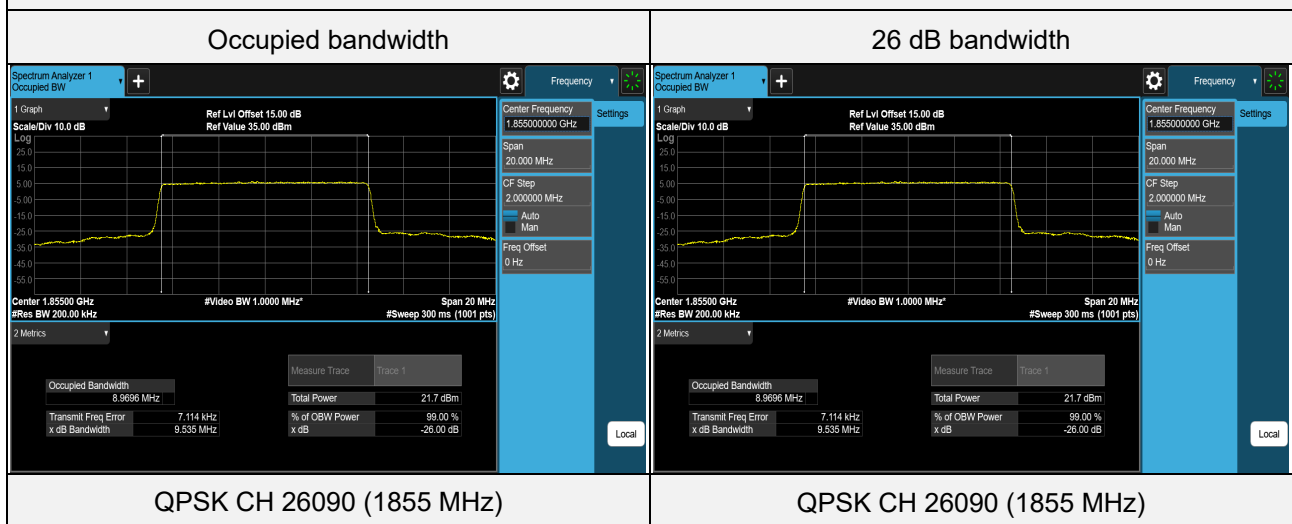


QPSK CH 26365 (1882.5 MHz)

LTE Band 25 (Channel Bandwidth 10MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26090	1855	8.9696	9.535
QPSK	26365	1882.5	8.9668	9.511
QPSK	26640	1910	8.9618	9.520
16QAM	26090	1855	4.5734	5.091
16QAM	26365	1882.5	4.5709	5.106
16QAM	26640	1910	4.5735	5.101

Spectrum Plot of Worst Value

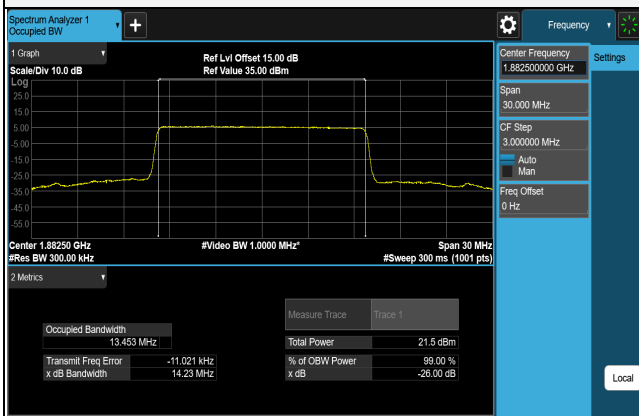


LTE Band 25 (Channel Bandwidth 15MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26115	1857.5	13.447	14.24
QPSK	26365	1882.5	13.453	14.23
QPSK	26615	1907.5	13.431	14.23
16QAM	26115	1857.5	4.6774	5.335
16QAM	26365	1882.5	4.6607	5.306
16QAM	26615	1907.5	4.6713	5.329

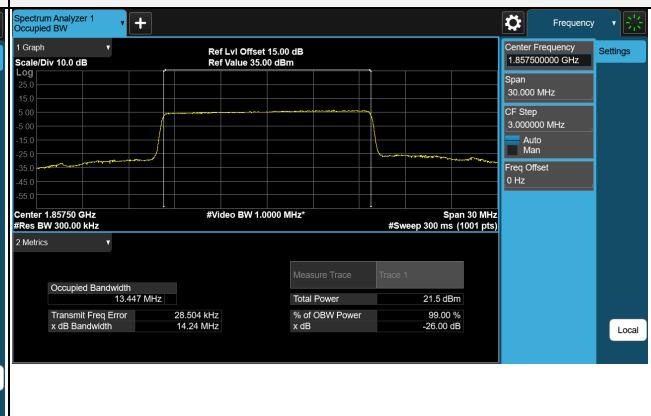
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 26365 (1882.5 MHz)

26 dB bandwidth



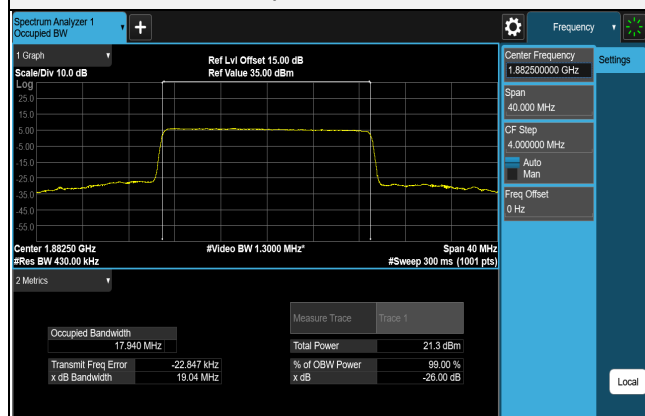
QPSK CH 26115 (1857.5 MHz)

LTE Band 25 (Channel Bandwidth 20MHz)

Test Condition	Channel	Frequency (MHz)	Occupied bandwidth (MHz)	26dB Bandwidth (MHz)
QPSK	26140	1860	17.902	19.01
QPSK	26365	1882.5	17.940	19.04
QPSK	26590	1905	17.909	19.01
16QAM	26140	1860	4.8235	5.567
16QAM	26365	1882.5	4.8206	5.605
16QAM	26590	1905	4.8146	5.602

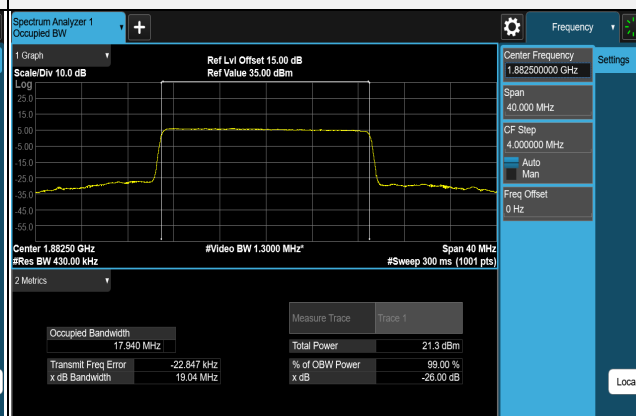
Spectrum Plot of Worst Value

Occupied bandwidth



QPSK CH 26365 (1882.5MHz)

26 dB bandwidth



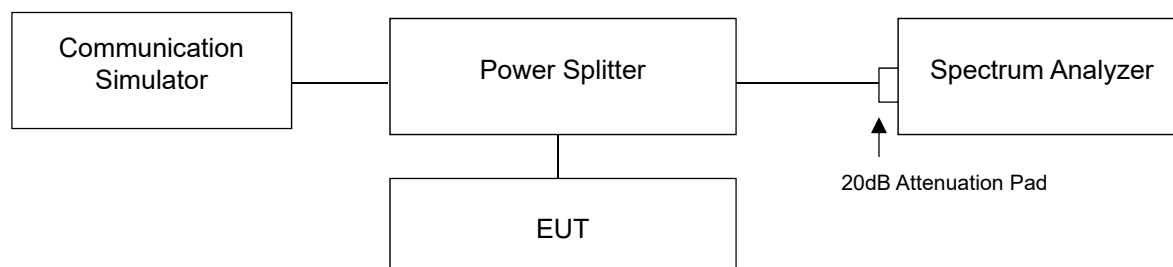
QPSK CH 26365 (1882.5MHz)

4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.5.2 Test Setup

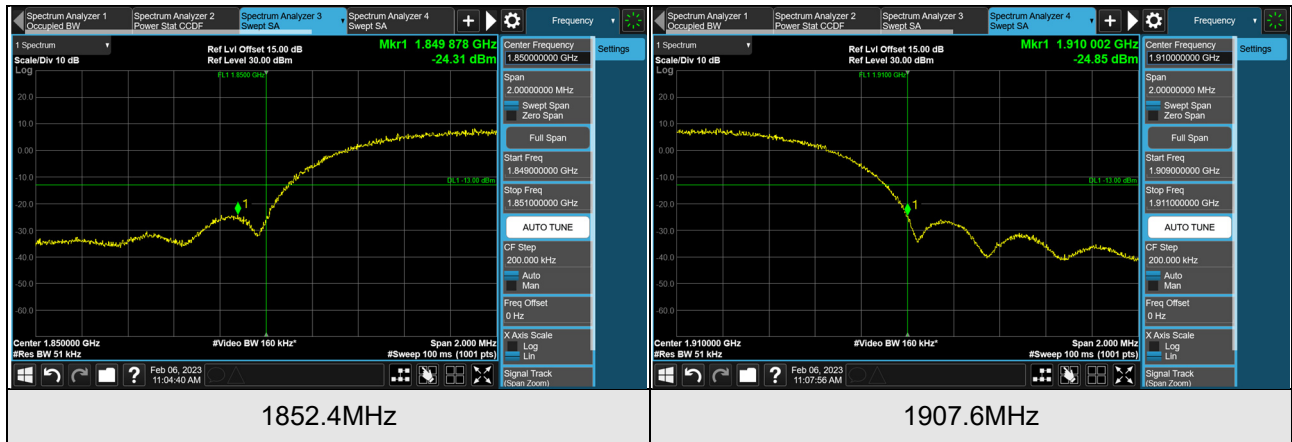


4.5.3 Test Procedures

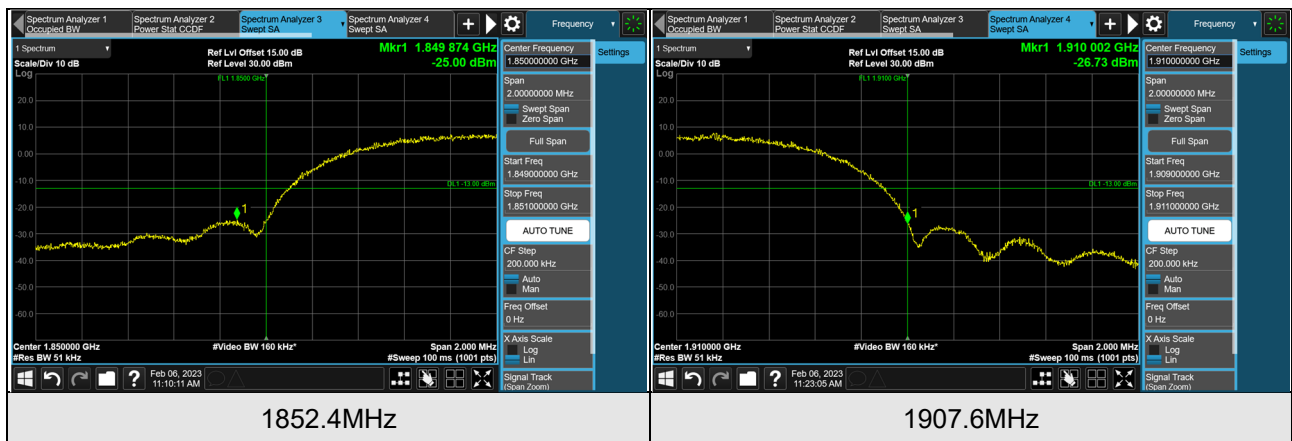
- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (WCDMA / HSDPA / HSUPA).
- c. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 15kHz and VB of the spectrum is 51kHz (LTE Channel Bandwidth 1.4MHz).
- d. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 3MHz).
- e. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (LTE Channel Bandwidth 5MHz).
- f. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
- g. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).
- h. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (LTE Channel Bandwidth 20MHz).
- i. Set the detector to power averaging (rms) detector.
- j. Record the max trace plot into the test report.

4.5.4 Test Results

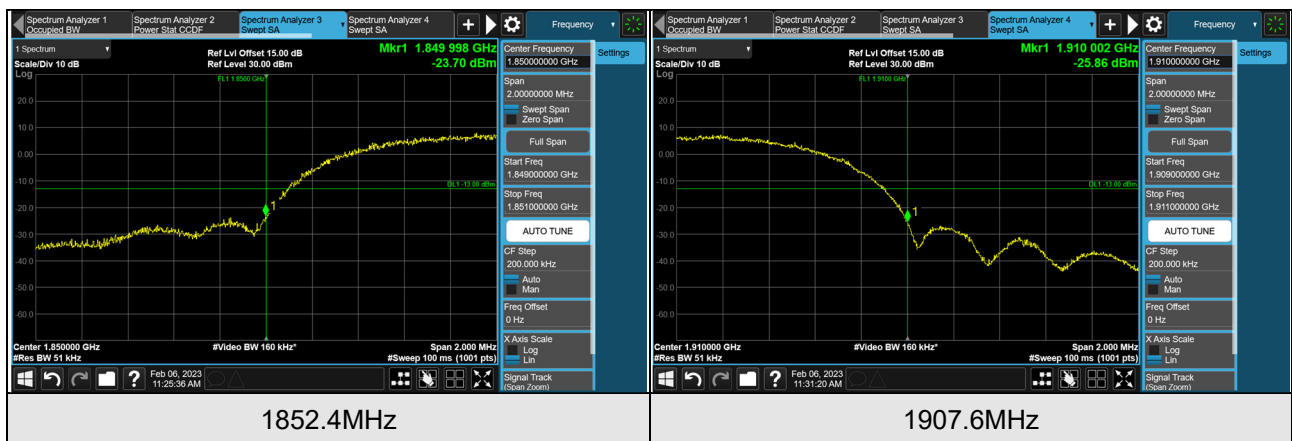
WCDMA Band 2



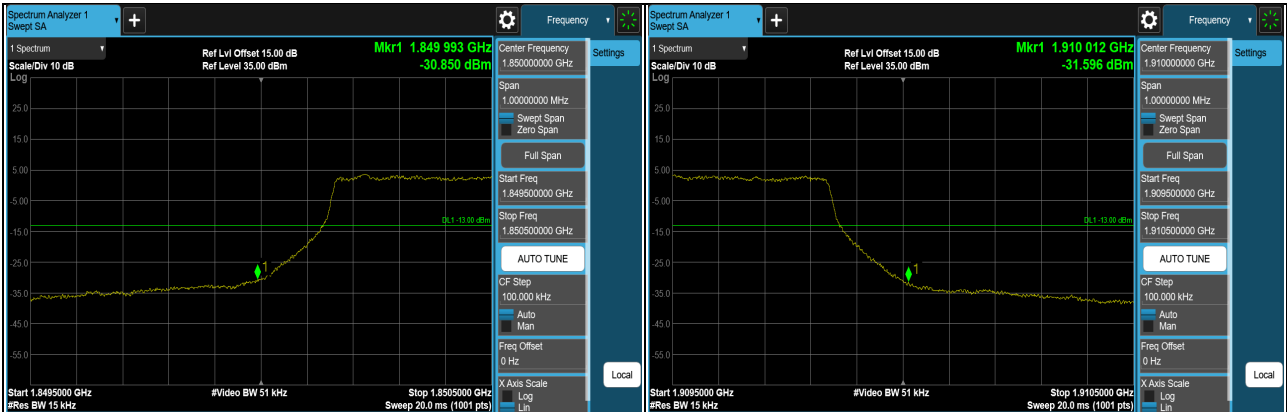
HSDPA



HSUPA

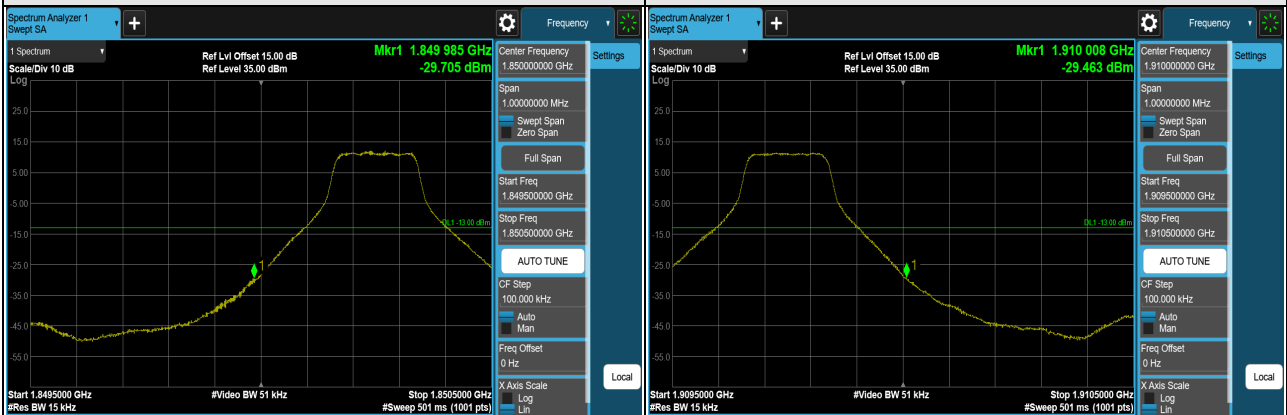


LTE Band 2 (Channel Bandwidth 1.4MHz)



FULL (1850.7MHz)

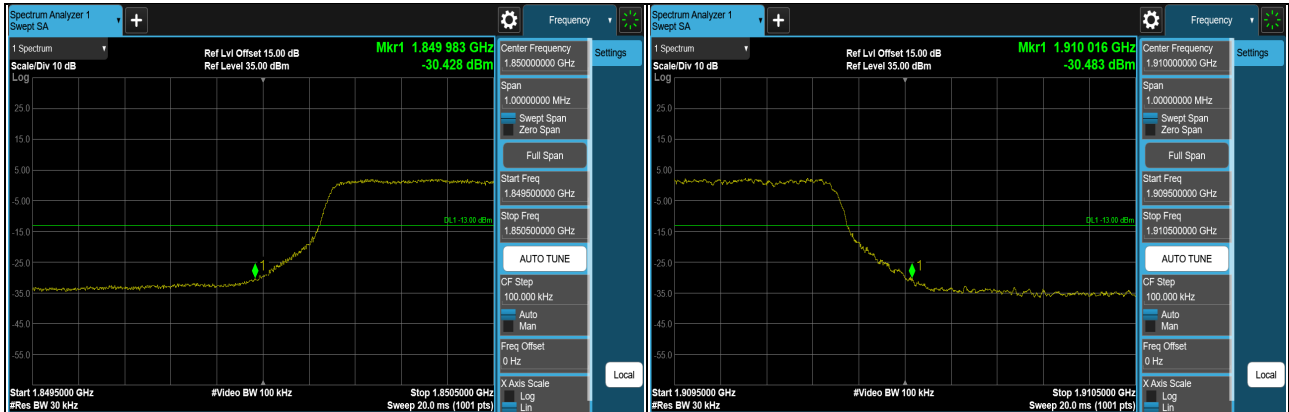
FULL (1909.3MHz)



1RB (1850.7MHz)

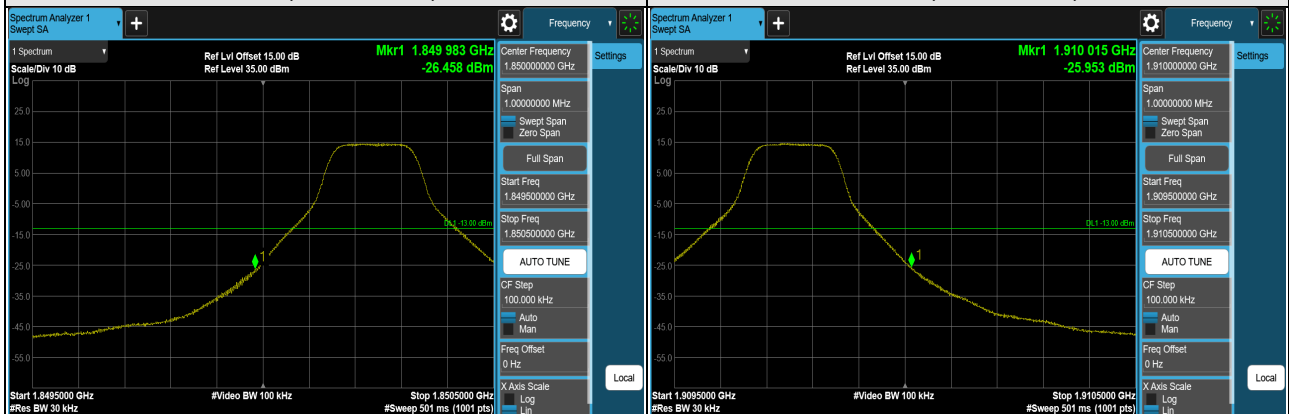
1RB (1909.3MHz)

LTE Band 2 (Channel Bandwidth 3MHz)



FULL (1851.5MHz)

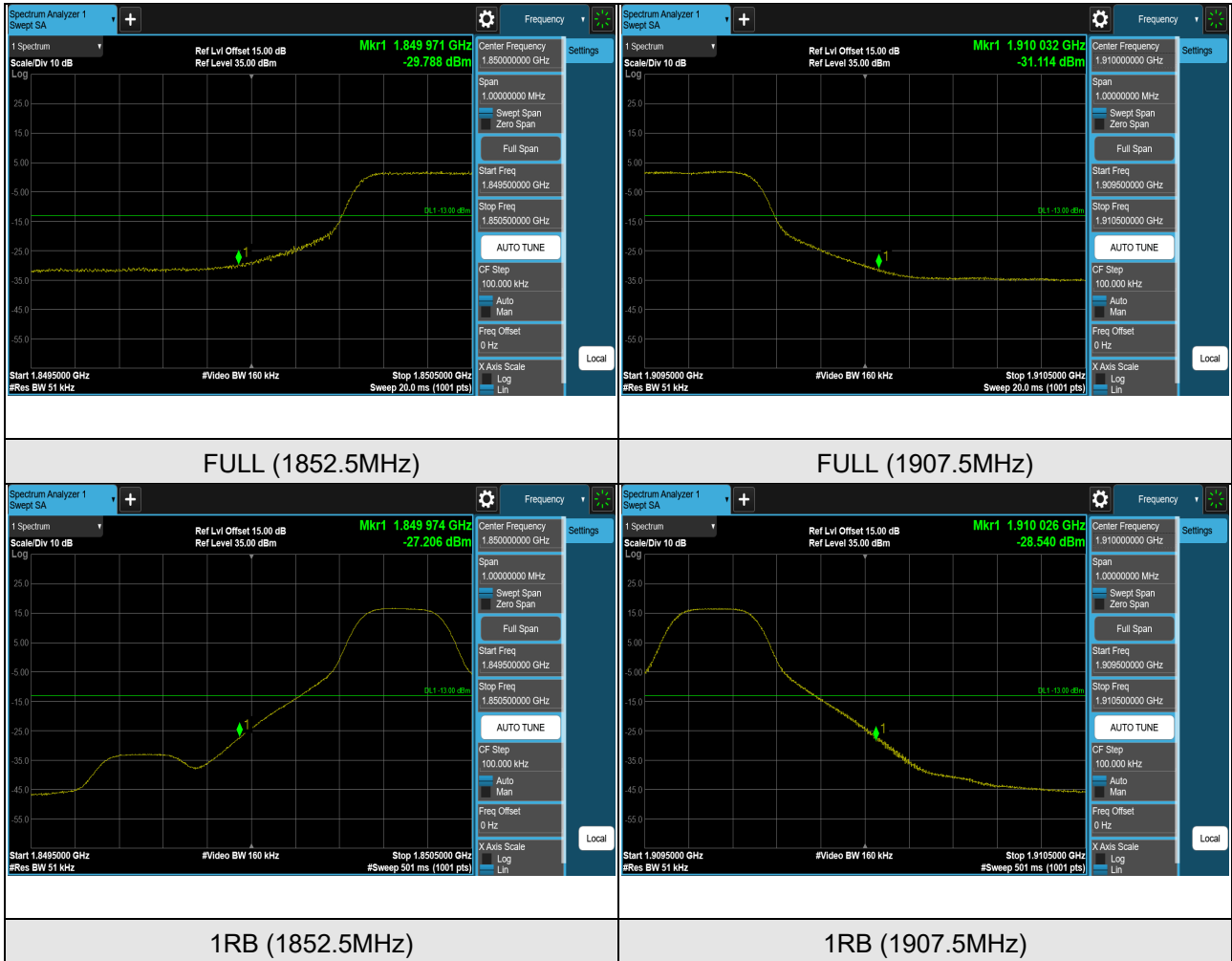
FULL (1908.5MHz)



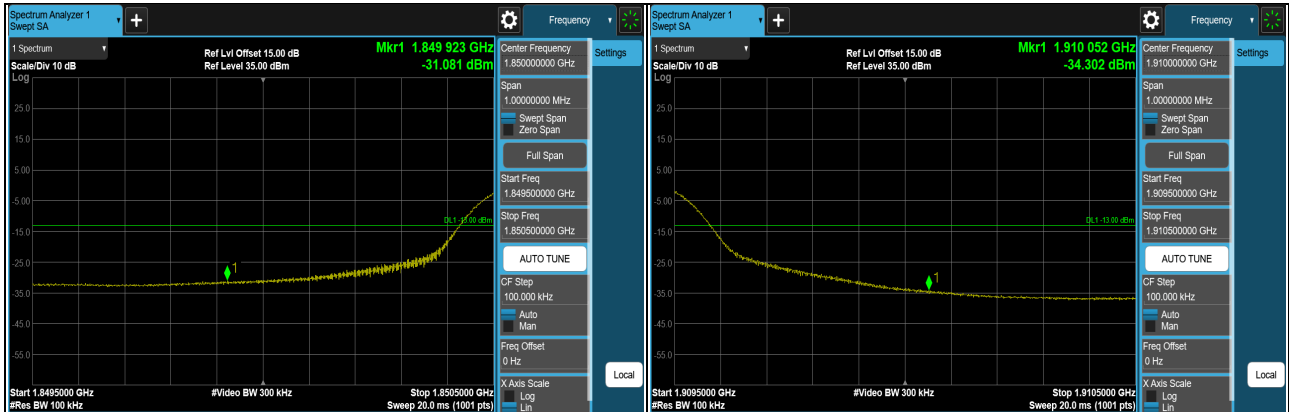
1RB (1851.5MHz)

1RB (1908.5MHz)

LTE Band 2 (Channel Bandwidth 5MHz)

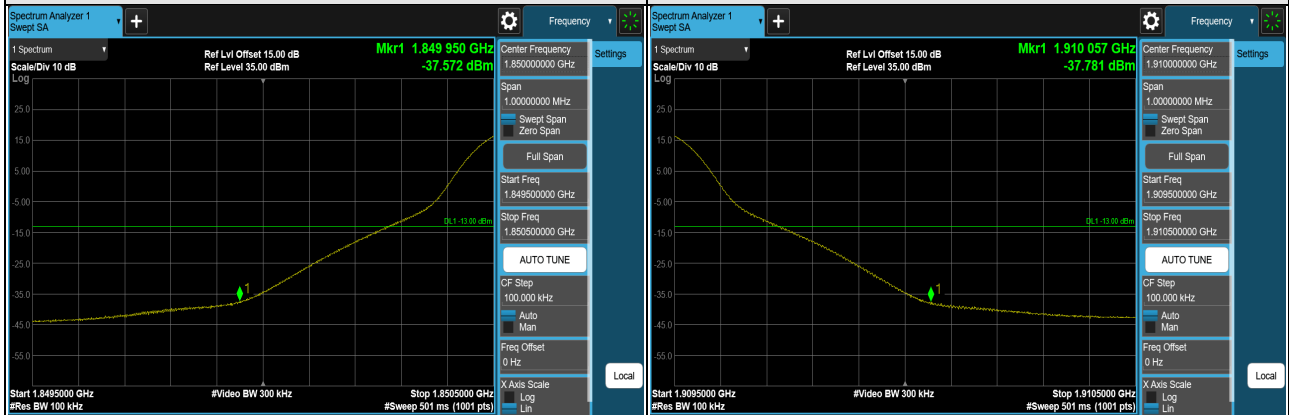


LTE Band 2 (Channel Bandwidth 10MHz)



FULL (1855MHz)

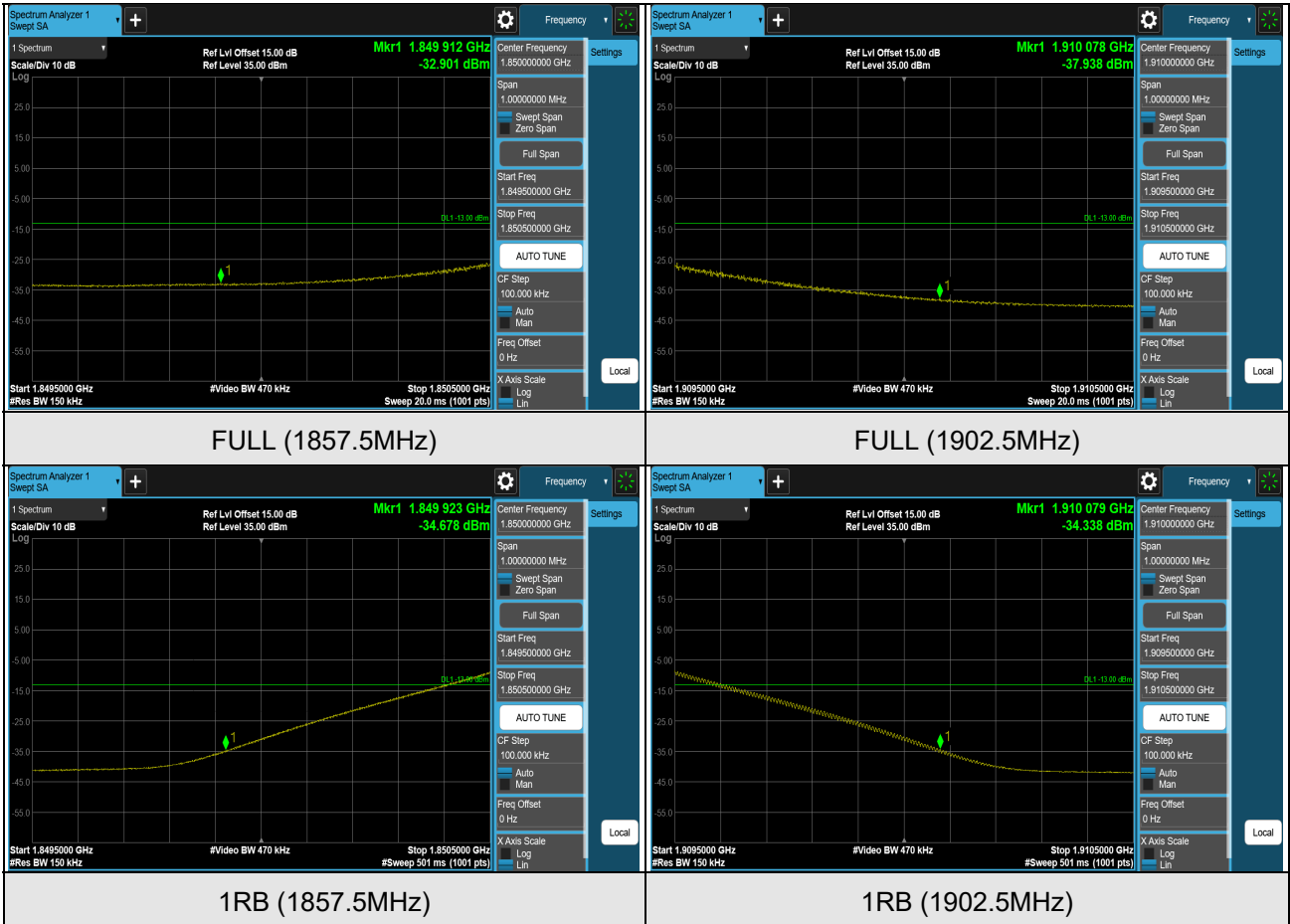
FULL (1905MHz)



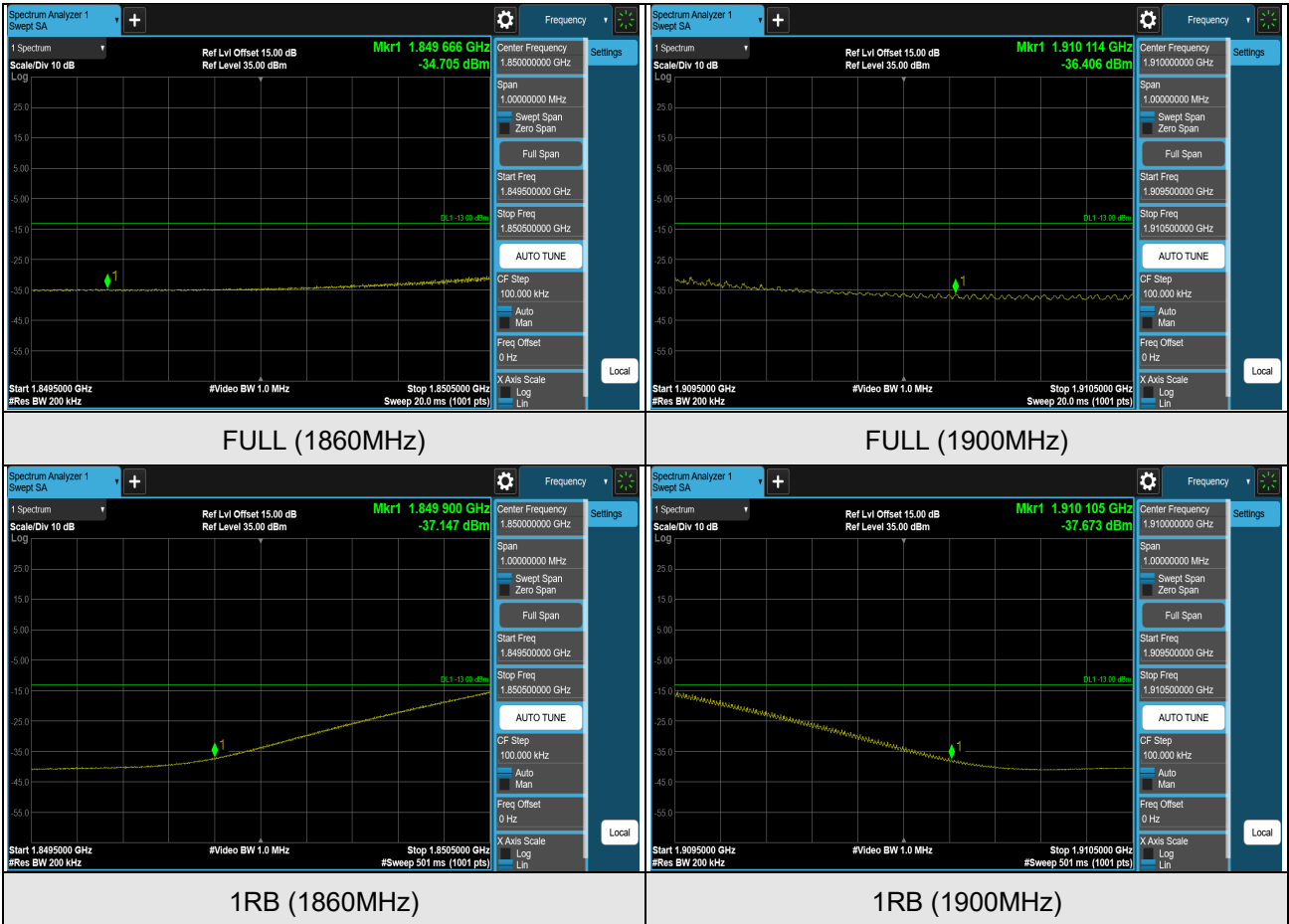
1RB (1855MHz)

1RB (1905MHz)

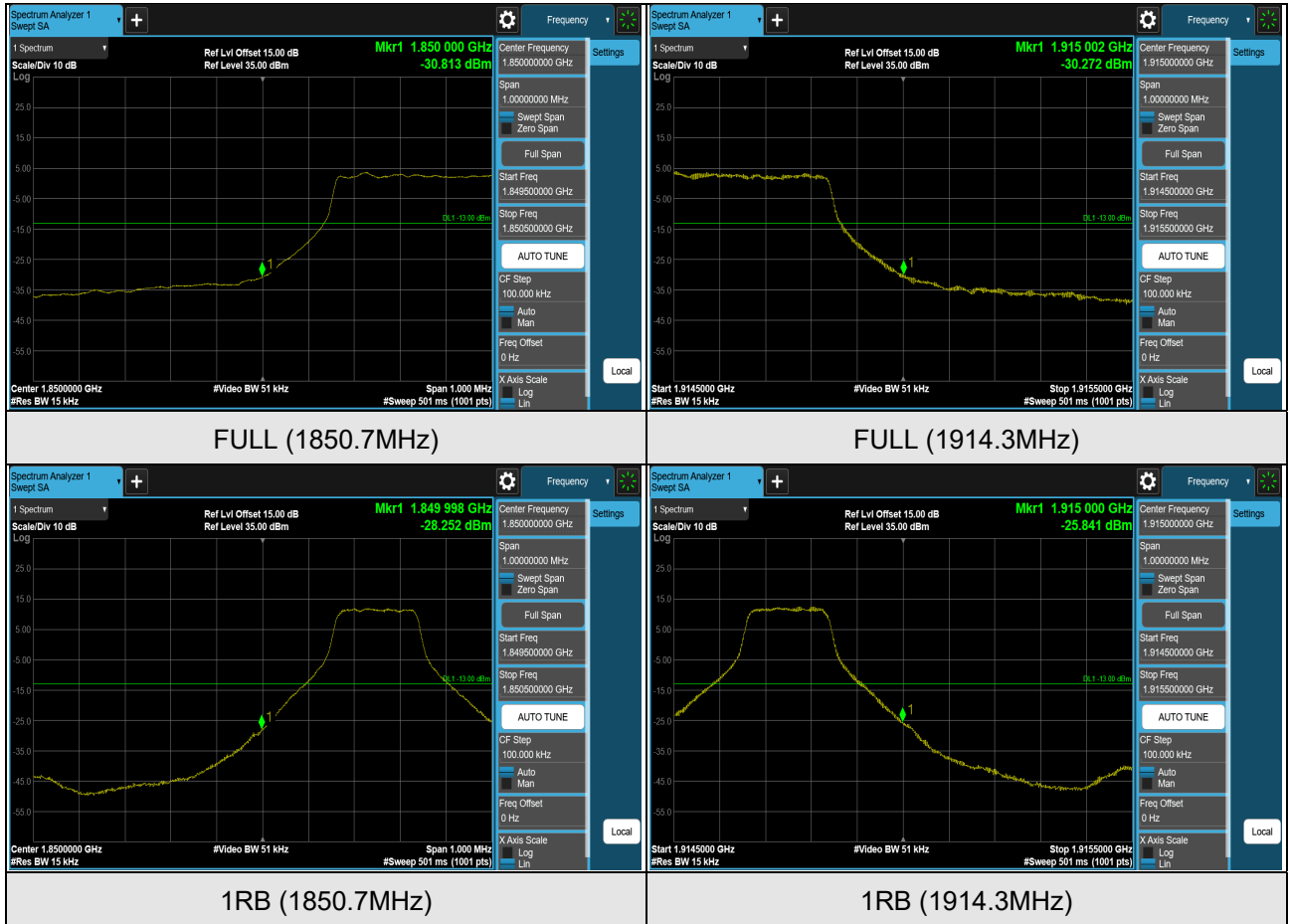
LTE Band 2 (Channel Bandwidth 15MHz)



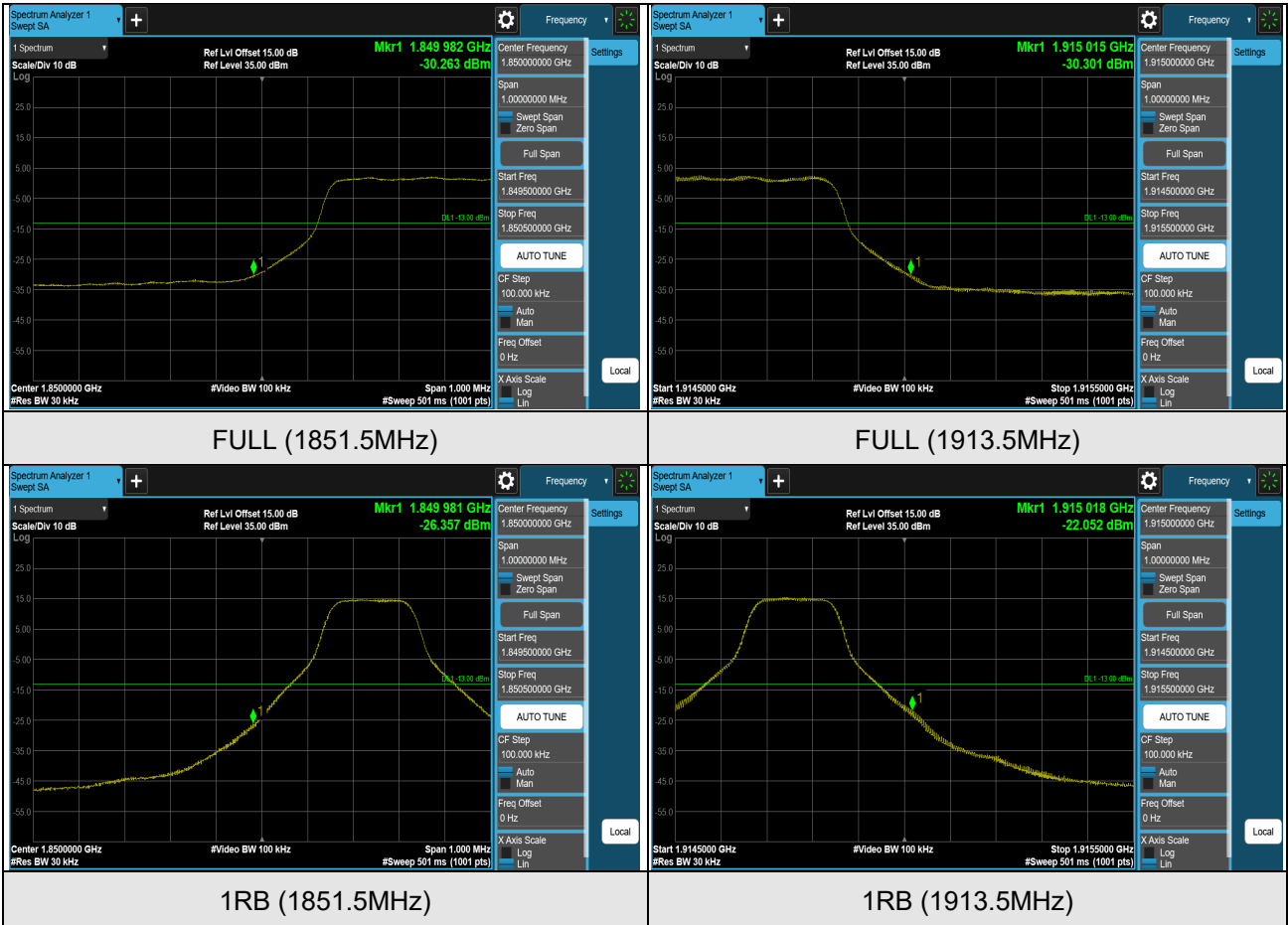
LTE Band 2 (Channel Bandwidth 20MHz)



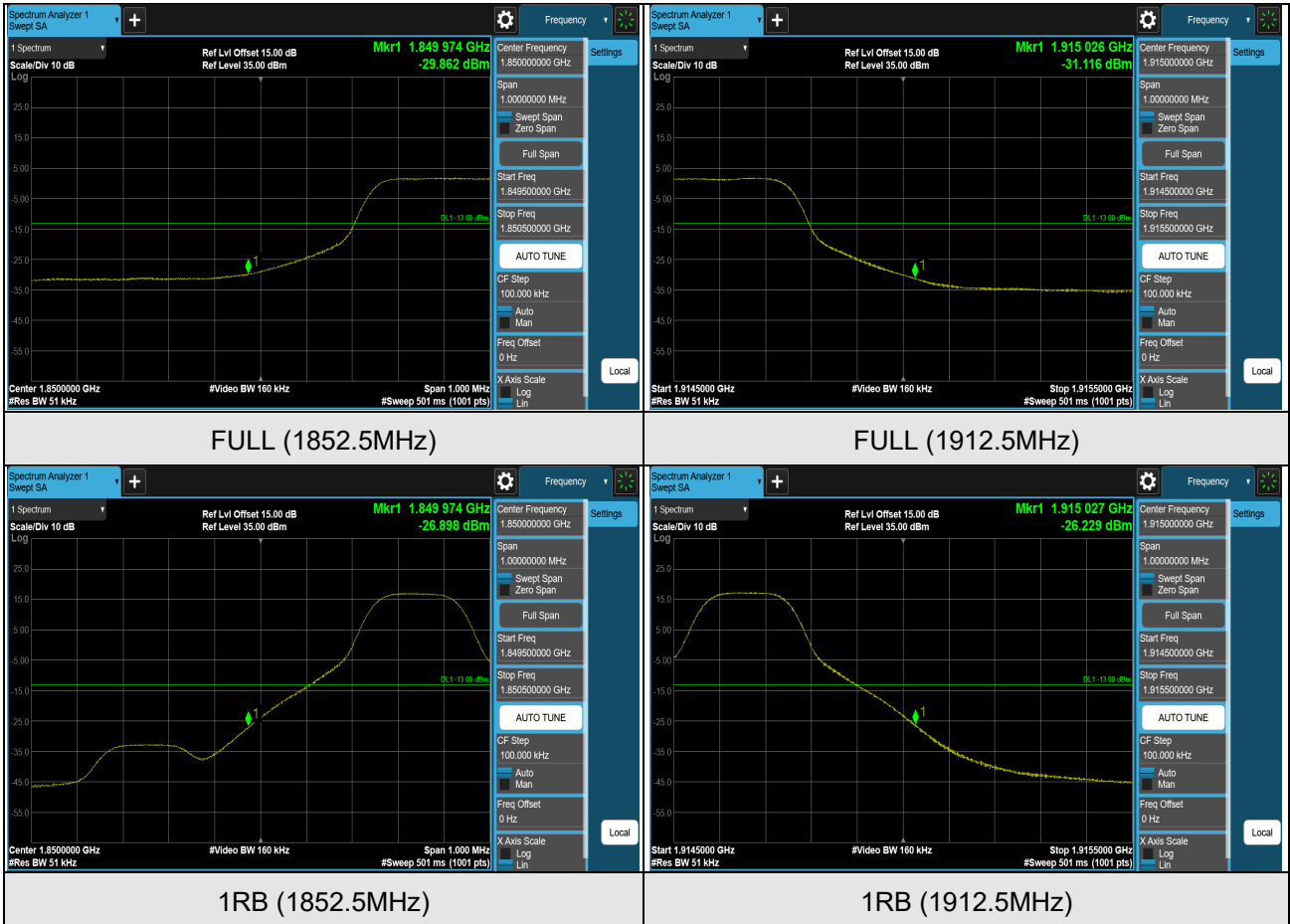
LTE Band 25 (Channel Bandwidth 1.4MHz)



LTE Band 25 (Channel Bandwidth 3MHz)



LTE Band 25 (Channel Bandwidth 5MHz)



LTE Band 25 (Channel Bandwidth 10MHz)

